



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

EducT

119

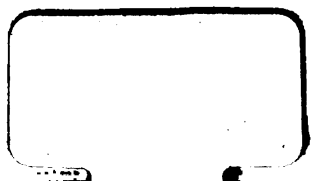
18.840

KEY TO
COMPLETE
BUSINESS ARITHMETIC

VAN TUYL

AMERICAN BOOK COMPANY

EducT 119.18.840





3 2044 097 008 304

)

KEY TO COMPLETE BUSINESS ARITHMETIC

BY

GEORGE H. VAN TUYL

TEACHER OF BUSINESS ARITHMETIC, HIGH SCHOOL OF COMMERCE
NEW YORK CITY

FORMERLY TEACHER OF ARITHMETIC IN THE ALBANY BUSINESS COLLEGE
ALBANY, N.Y., AND IN THE PACKARD COMMERCIAL SCHOOL
NEW YORK CITY



NEW YORK ··· CINCINNATI ··· CHICAGO
AMERICAN BOOK COMPANY

Ex. 7-11-18-40



COPYRIGHT, 1918, BY
GEORGE H. VAN TUYL.

KEY TO COMPLETE BUSINESS ARITHMETIC

W. P. 4

KEY TO VAN TUYL'S

COMPLETE BUSINESS ARITHMETIC

Page 88

34.	35.	36.	37.	38.	39.
\$ 2.08	\$ 2.56	\$ 5.46	\$ 7.46	\$ 1.63	\$ 3.65
2.73	3.61	5.93	4.04	2.35	2.16
4.21	3.97	4.14	4.74	4.80	5.00
4.40	3.49	1.88	2.60	4.37	1.64
2.41	2.78	2.23	4.22	4.17	3.28
3.99	4.59	2.72	7.46	2.12	5.24
<u>\$ 19.82</u>	<u>\$ 21.00</u>	<u>\$ 22.36</u>	<u>\$ 30.52</u>	<u>\$ 19.44</u>	<u>\$ 20.97</u>

40.	41.	42.
\$ 3.27	\$ 1.97	\$ 2.11
3.88	2.37	3.93
2.94	4.33	6.80
6.25	8.66	4.15
5.08	20.02	3.15
7.70	8.31	1.60
<u>\$ 29.12</u>	<u>\$ 45.66</u>	<u>\$ 21.74</u>

Page 90

§ 227.	1.	2.	3.	4.	5.	6.
	\$ 422.50	\$ 7.88	\$ 1562.50	\$.38	\$.77	\$ 23.25
	637.50	3.58	2402.50	1.69	1.15	5.25
	3.38	.56	1402.50	.67	21.56	46.25
	8.08	.54	1537.50	.96	60.56	29.25
	<u>\$ 1071.46</u>	<u>\$ 12.56</u>	<u>\$ 6905.00</u>	<u>\$ 3.70</u>	<u>\$ 84.04</u>	<u>\$ 104.00</u>

Page 92

NAMES OF EMPLOYEES	TIME		WAGES		TOTAL
	Regular	Overtime	Regular	Overtime	
	Hours	Hours			
James Addison . . .	48	7	\$ 27.00	\$ 4.92	\$ 31.92
Henry Buell . . .	48	3 $\frac{1}{2}$	24.00	2.19	26.19
John Crane . . .	48	4 $\frac{1}{2}$	24.00	2.81	26.81
William Crawford . .	48	10	21.00	5.47	26.47
Albert Jones . . .	48	9	19.50	4.57	24.07
Frank Landis . . .	48	4	18.00	1.88	19.88
Theodore Money . . .	48	6	18.00	2.81	20.81
James Newton . . .	48	5	18.00	2.34	20.34
George Orton . . .	48	5	16.50	2.15	18.65
Thomas Rooney . . .	48	8	15.00	3.13	18.13
			Total . . .		\$ 233.27

Page 109

24. $\frac{4}{5}$ of marked price = marked price.
 $\frac{1}{5}$ of marked price = discount.
 $\frac{3}{5}$ of marked price = selling price.
 $\frac{4}{5}$ of ? = \$ 4.50.
 $\$ 4.50 \div \frac{4}{5} = \$ 6.00$, marked price.
 $\frac{2}{3}$ of cost = cost.
 $\frac{1}{3}$ of cost = gain before marking down.
 $\frac{2}{3}$ of cost = marked price.
 $\frac{2}{3}$ of ? = \$ 6.00.
 $\$ 6.00 \div \frac{2}{3} = \$ 4.00$, cost.
 $\$ 4.50 - \$ 4.00 = \$.50$, gain after marking down.
 $\$.50 = ? \times \$ 4.00$.
 $\$.50 \div \$ 4.00 = \frac{5}{40} = \frac{1}{8}$, part gained.

Page 110

25. $868\frac{1}{2} \times \frac{3}{4} \times \$.14\frac{1}{2} = \$ 85.40$, selling price of $\frac{3}{4}$.
 $868\frac{1}{2} \times \frac{1}{4} \times \$.12\frac{1}{2} = \$ 36.91$, selling price of $\frac{1}{4}$.
 $\$ 85.40 + \$ 36.91 = \$ 122.31$, selling price of all.
33. $6 \times 8 \times \$.27\frac{1}{2} = \$ 13.20$, weekly wages.
 $\$ 13.20 - \$ 6.60 = \$ 6.60$, weekly savings.
 $13\frac{1}{2} \times \$ 36.50 = \$ 501.88$, cost of land.
 $\$ 501.88 \div \$ 6.60 = 76\frac{1}{4}$ weeks = 76 wk. 2 hr.

$$35. \$1.45 + \$1.87 + \$1.92 + \$2.03 + \$1.84 + \$1.75 + \$1.76 + \$1.84 \\ + \$2.06 + \$2.80 + \$2.47 + \$2.28 = \$24.07.$$

$$\$24.07 \div 12 = \$2.00\frac{7}{12}, \text{ or } \$2.01, \text{ average price.}$$

$$\$2.01 - \$1.45 = \$.56, \text{ increase.}$$

$$.56 = ? \times \$1.45.$$

$$.56 \div \$1.45 = \frac{56}{145}, \text{ or more than } \frac{1}{2} \text{ greater than first price.}$$

Page 111

36.

CLERK	TIME		WAGES		TOTAL
	Regular	Overtime	Regular	Overtime	
# 1.	48	7 $\frac{1}{4}$	\$ 16.50	\$ 3.12	\$ 19.62
# 2.	48	6	15.00	2.34	17.34
# 3.	48	2 $\frac{1}{2}$	20.00	1.30	21.30
# 4.	48	4 $\frac{1}{2}$	18.00	2.23	20.23
# 5.	48	1	14.50	.38	14.88
# 6.	48	4	16.00	1.67	17.67
# 7.	48	5 $\frac{1}{2}$	17.00	2.43	19.43
# 8.	48	4	19.50	2.03	21.53
					\$ 152.00

$$\# 1. \frac{7\frac{1}{4} \times \$16.50 \times 5}{48 \times 4} = \$3.12, \text{ extra pay for \# 1.}$$

37.

38.

39.

40.

41.

Total Milk . . .	53781 lb.	63114 lb.	63639 lb.	63256 lb.	61247 lb.
Total Cheese . .	5070 lb.	6119 lb.	6084 lb.	5997 lb.	5847 lb.
	@ 11 $\frac{1}{2}$ ¢	@ 11 $\frac{1}{2}$ ¢	@ 11 $\frac{1}{2}$ ¢	@ 10 $\frac{1}{2}$ ¢	@ 11 $\frac{1}{2}$ ¢
Total Money . . .	\$589.39	\$718.98	\$676.85	\$644.68	\$665.10
Total Expense . .	\$67.13	\$78.99	\$78.55	\$77.46	\$75.59
Pounds Milk to					
1 pound Cheese	10.607	10.314	10.46	10.548	10.475
Ratio97115	1.014	.9401	.8967	.9625
Your Milk . . .	1018 lb.	1165 lb.	1141 lb.	1150 lb.	1074 lb.
				\$10.31	
Less Cheese . . .				3 $\frac{1}{2}$ lb..38	
Your Money . . .	\$9.89	\$11.81	\$10.73	\$9.93	\$10.34

Page 115

9. 45 men : ? men :: 9 da. : 12 da.

$$\frac{12 \times 45 \text{ men}}{9} = 60 \text{ men.}$$

60 men - 45 men = 15 men, number of additional men required.

Page 116

- § 275. 1. 1st cause : 2d cause :: 1st effect : 2d effect.

75 sheets : 5000 sheets :: 24 lb. : ?.

36'' : 17''.

54'' : 22''.

$$\frac{200}{\cancel{5000}} \times 17 \times 22 \times \frac{4}{\cancel{24}} \text{ lb.} = 307 \text{ lb. 18 oz.}$$

$$\frac{17 \times 36 \times 54}{3 \times 9 \times 9}$$

2. 1st cause : 2d cause :: 1st effect : 2d effect.

36 sheets : 3000 sheets :: 2 lb. : ?.

24'' : 8''.

36'' : 12''.

$$\frac{500}{\cancel{3000}} \times 8 \times 12 \times 2 \text{ lb.} = 18 \text{ lb. 8 oz.}$$

$$\frac{36 \times 24 \times 36}{8 \times 3 \times 3}$$

Page 118

3.	4.	5.
\$ 7.78	\$ 40.00	\$ 90.48
7.08	510.00	119.13
19.23	332.00	66.94
15.53	47.04	130.32
21.02	\$ 929.04	39.53
10.07		418.43
\$ 80.71		\$ 864.83

Page 119

6. 428	7. 25,473
<u>873</u>	<u>2,237</u>
1,301	23,236
<u>873</u>	<u>2,237</u>
2,174	20,999
<u>873</u>	<u>2,237</u>
3,047	18,762
<u>873</u>	<u>2,237</u>
3,920	16,525
<u>873</u>	<u>2,237</u>
4,793	14,288
<u>873</u>	<u>2,237</u>
5,666	12,051
<u>873</u>	<u>2,237</u>
6,539	9,814
<u>873</u>	<u>2,237</u>
7,412	7,577
<u>873</u>	<u>2,237</u>
8,285	5,340
<u>873</u>	<u>2,237</u>
9,158	3,103
<u>873</u>	<u>2,237</u>
10,031	866

Page 120

9. \$ 187.50
272.00
1530.00
2300.00
925.00
<u>\$ 5214.50</u>
10. \$ 7.50
10.00
5.00
9.00
2.99
<u>\$ 34.49</u>

Quotient 11, Remainder 866.

- § 280. 1. $6 \times 17 \times \$1.50 = \153.00 , laborers.
 $6 \times 28 \times \$3.60 = \604.80 , mechanics.
 $6 \times 9 \times \$2.25 = \121.50 , teamsters.
 $2 \times \$15 = \30.00 , bookkeepers
 $\$1560 \div 52 = \30.00 , superintendent.
 $\$939.30$, weekly pay roll.

3. $\frac{1}{2}$ of $\frac{1}{2}$ of the mine = $\frac{1}{4}$ of the mine, part sold.
 $\frac{1}{4}$ of the mine = \$1710.
 $\$1710 \div \frac{1}{4} = \6840 , value of mine.

$$\begin{aligned}
 4. \quad & 1200 \times \$.08\frac{1}{2} = \$ 42.00 \\
 & 5 \times \$ 15 = 75.00 \\
 & 4 \times \$ 2.87\frac{1}{2} = 11.50 \\
 & 20 \times \$ 3.25 = 65.00 \\
 & 12 \times \$ 5.40 = 64.80 \\
 & 5) \$ 258.30, \text{ gross cost.} \\
 & \quad 51.66, \text{ discount.} \\
 & \quad \underline{\$ 206.64, \text{ net cost.}}
 \end{aligned}$$

Page 121

$$\begin{array}{rclcl}
 5. & 56^1 & 47^2 & 43^1 & 467\frac{1}{2} \times \$ 3.12\frac{1}{2} = \$ 1460.16 \\
 & 58^3 & 44^2 & 47^2 & 227\frac{1}{2} \times \$.57\frac{1}{2} = 130.81 \\
 & 57 & 43^3 & 48^3 & 325\frac{1}{2} \times \$.62\frac{1}{2} = 208.28 \\
 & 59^2 & 46^2 & 44 & \quad \quad \quad \$ 1794.25, \text{ total cost.} \\
 & 55^1 & 45^1 & 45^2 & \\
 & 60^1 & 227^2 & 48^2 & \\
 & 61^2 & & 47^3 & \\
 & 58^3 & & 325^1 & \\
 & \underline{467^1} & & &
 \end{array}$$

6.

SAFE

\$ 206.20	\$ 604.37
909.24	49.86
489.36	Bal. \$ 950.57
1604.80	1604.80
Bal. \$ 950.57	

BANK

\$ 1379.30	\$ 3.97
604.37	47.86
	396.25
	49.83
	246.97
	Bal. \$ 1238.79
\$ 1983.67	\$ 1983.67
Bal. \$ 1238.79	

$$\begin{aligned}
 7. \quad & 64 \times 12\frac{1}{2} \times \$.05\frac{1}{2} = \$ 44.00 \\
 & 19 \times \$ 5.50 = 104.50 \\
 & \underline{1740 \times \$.33} = 47.85 \\
 & 12 \\
 & 3.75 \times \$ 12.75 = 47.81 \\
 & 42 \times \$.08\frac{1}{2} = 3.57 \\
 & \quad \underline{\$ 247.73}
 \end{aligned}$$

- 8.
- $12 \times \$83\frac{1}{2} = \1000
- , salary per annum.

$$\$1000 - \$625.60 = \$374.40$$
, annual savings.

$$\$2300 \div \$374.40 = 6.14316 \text{ yr.} = 6 \text{ yr. } 1 \text{ mo. } 22 \text{ da.}$$

9.
$$\frac{348 \times \$14}{12} = \$4.06$$

$$643 \times \$0.06\frac{1}{2} = \$41.80$$

$$\frac{7750 \times \$5.87}{2000} = \$22.75$$

$$\qquad \qquad \qquad \$68.61$$

10. $287,138 \times \$0.082 = \$23,545.32$

$$7614 \times .12 = 913.68$$

$$7239 \times .066 = 477.77$$

$$4128 \times .167 = 689.38$$

$$\underline{\$25,626.15}$$

$$\$25,626.15 \div 1048 = \$24.45$$
, average.

Page 136

13. 1 Kg. = 10,000 dg., no. powders.

$$\frac{10,000 \times \$10}{12} = \$83.33$$
, selling price.

$$\$83.33 - \$8.00 = \$75.33$$
, gain.

Page 137

- 19.
- $\frac{1}{3} \times 5280 \text{ ft.} = 1980 \text{ ft.}$
- , length of fence.

$$\frac{1980 \times 4}{12} = 660$$
, no. boards.

Page 139

13. 1 Kg. = 15,432 gr.

$$\frac{4 \times 15432 \text{ gr.}}{4 \times 24} = 643$$
, no. rings.

14. 5 pwt. 8 gr. = 128 gr.

$$\text{Gold 18K fine} = \frac{2}{3} \text{ pure gold.}$$

$$\frac{2}{3} \text{ of } 128 \text{ gr.} = 96 \text{ gr.}$$
, pure gold in one ring.

$$24 \times 96 \text{ gr.} = 2304 \text{ gr.}$$
, pure gold in 24 rings.

$$2304 \text{ gr.} \div 15.432 \text{ gr.} = 149.3$$
, no. g.

- 15.
- $24 \times \$4.75 = \114
- , cost.

$$\frac{24 \times 2240}{2000} = 26.88$$
, no. short tons.

$$26.88 \times \$6 = \$161.28$$
, selling price.

$$\$161.28 - \$114 = \$47.28$$
, gain.

Page 143

11. $\frac{76 \times 1000 \times 39.37 \text{ in.}}{63360 \text{ in.}} = 47.224$, speed in mi. per hour of train in

France.

50 mi. - 47.224 mi. = 2.776 mi. U. S. train faster.

12. $348 \times \$.40 = \$ 139.20$, cost.

$\frac{348 \times 39.37 \text{ in.}}{36 \text{ in.}} = 380.57\frac{1}{3}$, no. yd.

$380.57\frac{1}{3} \times \$.50 = \$ 190.29$, selling price.

$\$ 190.29 - \$ 139.20 = \$ 51.09$, gain.

17. $480 \times .3524 \text{ Hl.} = 169.152 \text{ Hl.}$

$480 \times \$.90 = \$ 432$, selling price by bushels.

$169.152 \times \$ 2.50 = \$ 422.88$, selling price by hectoliters.

$\$ 432.00 - \$ 422.88 = \$ 9.12$, gain.

19. $20 \times 280 \text{ lb.} = 5600 \text{ lb.}$

$5600 \times \$.05 = \$ 280$, cost at 5¢ a pound.

$5600 \text{ lb.} \div 2.2046 \text{ lb.} = 2540.14$, no. Kg.

$2540.14 \times \$.11 = \$ 279.42$, cost at 11¢ a kilogram.

$\$ 280 - \$ 279.42 = \$.58$, better at 11¢ a kilogram.

Page 144

23. $40 \text{ Hl.} = 40 \times 2.8377 \text{ bu.} = 113.508 \text{ bu.}$

1 Ha. = 2.471 A.

$113.508 \text{ bu.} \div 2.471 = 45.936 \text{ bu. per acre.}$

Page 159

19. (a) $2 \times 80 \text{ ft.} - 6 \text{ ft.} = 154 \text{ ft.}$, length of walk.

$\frac{6 \times 154}{9} = 102\frac{2}{3}$, no. sq. yd. in area of walk.

(b) $2 \times 80 \text{ ft.} + 6 \text{ ft.} = 166 \text{ ft.}$, length of walk.

$\frac{6 \times 166}{9} = 110\frac{2}{3}$, no. sq. yd. in area of walk.

Page 161

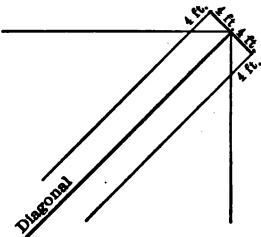
24. $600 \times 600 = 360,000$, product of half the perimeter and the differences between half the perimeter and the three sides.
 $10 \times 20 \times 30 = 6000$, product of the three remainders.
 $360,000 \div 6000 = 60$, half the perimeter.
 $60 - 10 = 50$, no. ft., one side.
 $60 - 20 = 40$, no. ft., second side.
 $60 - 30 = 30$, no. ft., third side.

Page 163

11. $14^2 = 196$. $196 + 121 + 64 = 381$.
 $11^2 = 121$.
 $8^2 = 64$. $\sqrt{381} = 19.5^+$, no. ft. in diagonal.

13. $16^2 \times 2 = 512$.
 $\sqrt{512} = 22.627$, no. rd. in diagonal.
 $22.627 \times 16\frac{1}{2}$ ft. = 373.3 ft., length of diagonal.

Eight small triangles, like the two shown in the diagram, are outside the walk. A right triangle with a base and altitude each 4 ft. is equal to a rectangle 2 ft. \times 4 ft. Eight of these small triangles are equal to a rectangle 16 ft. \times 4 ft. or 8 ft. \times 8 ft.



The diagonals cross at right angles, hence there are 8 ft. of length in the middle of one of the diagonals not to be included. This, together with the small triangles, makes a total of 16 ft. to be deducted from the gross length of both diagonals.

Therefore, 2×373.3 ft. - 16 ft. = 730.6 ft., the net length of walk.
 (8×730.6) sq. ft. = 5844.8 sq. ft., area of both walks.

Page 167

1. 40×160 sq. rd. = 6400 sq. rd., area.
 $\sqrt{6400} = 80$, no. of rods in one side of square.
 $4 \times 80 \times \$1.15 = \368 , cost to fence square.
 6400 sq. rd. $\div .7854 = 8148.714$ sq. rd., square of diameter.

$$\sqrt{8148.714} = 90.27, \text{ no. rd., diameter.}$$

$$3.1416 \times 90.27 \times \$1.15 = \$326.13, \text{ cost to fence circle.}$$

$$\$368 - \$326.13 = \$41.87, \text{ less.}$$

3. $32 \times 160 \text{ sq. rd.} = 5120 \text{ sq. rd., area.}$

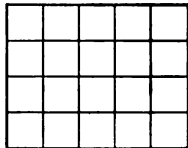
$$4 \times 5 = 20, \text{ no. squares.}$$

$$5120 \text{ sq. rd.} \div 20 = 256 \text{ sq. rd. in each square.}$$

$$\sqrt{256} = 16, \text{ no. rd., one side of small square.}$$

$$4 \times 16 \text{ rd.} = 64 \text{ rd., width.}$$

$$5 \times 16 \text{ rd.} = 80 \text{ rd., length.}$$



7. $3 \times 6 \text{ ft.} = 18 \text{ ft., perimeter of one triangle.}$

$$\frac{1}{2} \text{ of } 18 \text{ ft.} = 9 \text{ ft.; } 9 \text{ ft.} - 6 \text{ ft.} = 3 \text{ ft.; } 9 \times 3 \times 3 \times 3 = 243.$$

$$\sqrt{243} = 15.588, \text{ no. sq. ft., area of one triangle.}$$

$$6 \times 15.588 \text{ sq. ft.} = 93.528 \text{ sq. ft., area of hexagon.}$$

8. $(200 \times 200) \text{ sq. ft.} = 40,000 \text{ sq. ft., area of court.}$

$$\frac{1}{4} \text{ of } 40,000 \text{ sq. ft.} = 10,000 \text{ sq. ft., area of walk.}$$

$$40,000 \text{ sq. ft.} - 10,000 \text{ sq. ft.} = 30,000 \text{ sq. ft. remaining area.}$$

$$\sqrt{30,000} = 173.205, \text{ no. ft., length of one side of remaining area.}$$

$$200 \text{ ft.} - 173.205 \text{ ft.} = 26.795 \text{ ft., twice width of walk.}$$

$$\frac{1}{2} \text{ of } 26.795 \text{ ft.} = 13.3975 \text{ ft., width of walk.}$$

9. $36 \text{ ft.} + 45 \text{ ft.} + 60 \text{ ft.} = 141 \text{ ft., perimeter.}$

$$\frac{1}{2} \text{ of } 141 \text{ ft.} = 70\frac{1}{2} \text{ ft.}$$

$$70\frac{1}{2} - 36 = 34\frac{1}{2}.$$

$$70\frac{1}{2} - 45 = 25\frac{1}{2}.$$

$$70\frac{1}{2} - 60 = 10\frac{1}{2}.$$

$$70\frac{1}{2} \times 34\frac{1}{2} \times 25\frac{1}{2} \times 10\frac{1}{2} = 651,234\frac{1}{8}.$$

$$\sqrt{651,234\frac{1}{8}} = 806.99 \text{ no. sq. ft., area.}$$

$$806.99 \text{ sq. ft.} \div 9 \text{ sq. ft.} = 89.665, \text{ no. sq. yd., area.}$$

$$89.665 \times \$2.60 = \$233.13, \text{ cost.}$$

10. $50^2 = 2500$; $\frac{1}{2} \text{ of } 2500 = 1250, \text{ no. sq. rd., area.}$

Page 169

7. $3 \times 3 = 9$; $\frac{1}{2} \text{ of } 9 = 4\frac{1}{2}$; $4\frac{1}{2} \div 3 = 1\frac{1}{2}.$

$$4\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2} = 15\frac{3}{8} = 15.1875.$$

$$\sqrt{15.1875} = 3.897, \text{ no. sq. ft., area of one triangle.}$$

$$6 \times 3.897 \text{ sq. ft.} = 23.382 \text{ sq. ft., area of base of prism}$$

$$12 \times 23.382 = 280.584, \text{ no. cu. ft., volume.}$$

Page 171

12. $2 \times (8\frac{1}{2} + 6\frac{1}{2}) \times 4 = 118\frac{2}{3}$, no. sq. ft., sides and ends.
 $8\frac{1}{2} \times 6\frac{1}{2} = 54\frac{1}{4}$, no. sq. ft., area of top.
 $118\frac{2}{3}$ sq. ft. + $54\frac{1}{4}$ sq. ft. = $172\frac{2}{3}$ sq. ft., total area.
 $\frac{172\frac{2}{3} \times \$.20}{9} = \$ 3.84$, cost.

Page 172

13. $3.1416 \times 9 \times 7\frac{1}{4} = 212.058$, no. sq. in., side of one pail.
 $9 \times 9 \times .7854 = 63.6174$, no. sq. in., area of bottom.
 212.058 sq. in. + 63.6174 sq. in. = 275.6754 sq. in., tin for one pail.
 $\frac{96 \times 275.6754 \text{ sq. in.}}{144 \text{ sq. in.}} = 183.7836$, no. sq. ft.
 8×3 sq. ft. = 24 sq. ft. for seams and waste.
 $\frac{183.7836 \text{ sq. ft.} + 24 \text{ sq. ft.}}{9 \text{ sq. ft.}} = 23.08+$, no. sq. yd., total amount of tin.
14. $2 \times (12 + 3\frac{1}{2}) \times 1\frac{1}{2} \times 2 = 91\frac{1}{2}$, no. sq. ft., area of inside and outside of sides and ends.
 $3\frac{1}{2} \times 12 = 39$, no. sq. ft., area of bottom.
 $91\frac{1}{2}$ sq. ft. + 39 sq. ft. = $130\frac{1}{2}$ sq. ft., total area.
18. $10 \times 10 \times 2 = 200$, no. sq. ft., area top and bottom.
 500 sq. ft. - 200 sq. ft. = 300 sq. ft., area of sides.
 4×10 ft. = 40 ft., perimeter.
 $300 \div 40 = 7\frac{1}{2}$, no. ft. deep.

Page 174

7. $\frac{8 \times 8 \times 24}{3} = 512$, no. cu. ft., volume of original pyramid.
 $\frac{4 \times 4 \times 12}{3} = 64$, no. cu. ft., volume of part cut off.
 $\frac{64}{512} = \frac{1}{8}$, fractional part of original pyramid.

Page 175

10. $\frac{1}{4}$ of 746 ft. = 373 ft. $\sqrt{139,129 + 230,400} = 607.8889$, no. feet
 $373^2 = 139,129$ in slant height.
 $480^2 = 230,400$

$$\frac{4 \times 746 \times 607.8889}{2} = 906,970.2388, \text{ no. sq. ft. in lateral surface.}$$

$$906,970.2388 \text{ sq. ft.} = 20 \text{ A. } 131 \text{ sq. rd. } 11 \text{ sq. yd. } 6\frac{1}{2} \text{ sq. ft.}$$

$$\frac{746 \times 746 \times 480}{3 \times 27} = 3,297,873, \text{ no. cu. yd., volume.}$$

$$746 \times 746 = 556,516, \text{ no. sq. ft.} = 12 \text{ A. } 124 \text{ sq. rd. } 4 \text{ sq. yd. } 1 \text{ sq. ft.,}$$

area of the base.

Page 181

$$4. \frac{8 \times 4 \times 2 \times 19.258 \times 62\frac{1}{2}}{12 \times 12 \times 12} = 44.5787, \text{ no. lb. Avoir.}$$

$$\frac{44.5787 \times 7000 \text{ gr.}}{5760 \text{ gr.}} = 54.1755, \text{ no. lb. Troy, or } 54 \text{ lb. } 2 \text{ oz. } 2 \text{ pwt.}$$

2.88 gr.

$$8. \quad 1\frac{1}{2} \times 8.788 \times 62\frac{1}{2} \text{ lb.} = 823\frac{1}{2} \text{ lb., weight of rod in air.}$$

$$1\frac{1}{2} \times 62\frac{1}{2} \text{ lb.} = 93\frac{3}{4} \text{ lb., weight of water displaced.}$$

$$823\frac{1}{2} \text{ lb.} - 93\frac{3}{4} \text{ lb.} = 730\frac{1}{4} \text{ lb., weight of rod in water.}$$

$$9. \quad 12 \times 1 \times \frac{1}{2} = 3, \text{ no. cu. ft., volume of plank.}$$

$$3 \times .4 \times 62\frac{1}{2} \text{ lb.} = 75 \text{ lb., weight of plank.}$$

$$3 \times 62\frac{1}{2} \text{ lb.} = 187\frac{1}{2} \text{ lb., weight of 3 cu. ft. of water.}$$

$$187\frac{1}{2} \text{ lb.} - 75 \text{ lb.} = 112\frac{1}{2} \text{ lb., weight plank will support.}$$

$$12. \quad 1 \times 8 \times 4 = 32, \text{ no. cu. ft. in block of ice.}$$

$$1.000 - .920 = .080, \text{ difference in specific gravity between water and ice.}$$

$$.08 \times 62\frac{1}{2} \text{ lb.} = 5 \text{ lb., weight 1 cu. ft. of ice will support.}$$

$$32 \times 5 \text{ lb.} = 160 \text{ lb., weight block of ice will support.}$$

Page 189

$$1. \quad 2 \times (18 + 16) \times 9 = 612, \text{ no. sq. ft. in walls.}$$

$$18 \times 16 = 288, \text{ no. sq. ft. in ceiling.}$$

$$\frac{(3 \times 6\frac{1}{2} \times 2) + (3\frac{1}{2} \times 7 \times 2)}{2} = 44, \text{ no. sq. ft. to be deducted for openings.}$$

$$612 \text{ sq. ft.} + 288 \text{ sq. ft.} - 44 \text{ sq. ft.} = 856 \text{ sq. ft. to be plastered.}$$

$$\frac{856 \times \$.60}{9} = \$ 57.07, \text{ cost of plastering.}$$

$$2 \times (18 \text{ ft.} + 16 \text{ ft.}) = 68 \text{ ft., perimeter of room.}$$

68 ft. $- [(2 \times 3 \text{ ft.}) + (2 \times 3\frac{1}{2} \text{ ft.})] = 55 \text{ ft.}$, net perimeter.

55 ft. $\div 1\frac{1}{2} \text{ ft.} = 36\frac{2}{3}$ or 37, no. strips required.

48 ft. $\div 9 \text{ ft.} = 5$, no. strips from a roll.

37 strips $\div 5 \text{ strips} = 7\frac{2}{5}$ or 8, no. rolls.

$8 \times \$1.20 = \9.60 , cost of papering.

* 16 ft. $\div 2\frac{1}{2} \text{ ft.} = 7\frac{1}{2}$ or 8, no. strips of carpet required.

$\frac{8 \times 18 \text{ ft.}}{3} = 48$, no. yd. carpet.

$48 \times \$1.40 = \67.20 , cost of carpeting.

$\$57.07 + \$9.60 + \$67.20 = \133.87 , total cost.

2. $2 \times (16 + 12) \times 8\frac{1}{2} = 476$, no. sq. ft. in walls.

$16 \times 12 = 192$, no. sq. ft. in ceiling.

476 sq. ft. $+ 192 \text{ sq. ft.} = 668 \text{ sq. ft.}$ to be plastered.

$\frac{668 \times \$.70}{9} = \51.96 , cost of plastering.

$2 \times (16 \text{ ft.} + 12 \text{ ft.}) = 56 \text{ ft.}$, perimeter of room.

56 ft. $- [(3 \times 4 \text{ ft.}) + 3 \text{ ft.}] = 41 \text{ ft.}$, net perimeter.

41 ft. $\div 1\frac{1}{2} \text{ ft.} = 27\frac{1}{3} = 28$, no. strips required.

48 ft. $\div 8\frac{1}{2} \text{ ft.} = 5$, whole strips from a roll.

28 strips $\div 5 \text{ strips} = 5\frac{3}{5}$ or 6, no. of rolls.

$6 \times \$.90 = \5.40 , cost of papering.

$\frac{16 \times 12 \times \$.75}{9} = 16$, cost of painting.

$\$51.96 + \$5.40 + \$16 = \73.36 , total cost.

3. $\frac{26 \times 16 \times \$.80}{9} = \36.98 , cost of kalsomining.

$2 \times (26 \text{ ft.} + 16 \text{ ft.}) = 84 \text{ ft.}$, perimeter of room.

84 ft. $- [(4 \times 4 \text{ ft.}) + (3 \times 4 \text{ ft.})] = 56 \text{ ft.}$, net perimeter.

56 ft. $\div 1\frac{1}{2} \text{ ft.} = 37\frac{1}{3}$ or 38, no. strips required.

48 ft. $\div 10\frac{1}{2} \text{ ft.} = 4$, whole strips from a roll.

38 strips $\div 4 \text{ strips} = 9\frac{1}{2}$ or 10, no. of rolls.

$10 \times \$2.50 = \25 , cost of papering.

16 ft. $\div 2\frac{1}{2} \text{ ft.} = 7\frac{1}{2}$ or 8, no. strips of carpet required.

* If the carpet is laid crosswise of the room there will be no waste in turning under part of the strip. The result, then, would be: $\frac{8 \times 16}{8} = 42\frac{2}{3}$, no. yd. carpet required.

$$\frac{8 \times 26 \text{ ft.}}{3} = 69\frac{1}{3}, \text{ no. yd. carpet.}$$

$$69\frac{1}{3} \times \$2.25 = \$156, \text{ cost of carpeting.}$$

$$\$36.98 + \$25 + \$156 = \$217.98, \text{ total cost.}$$

4. $2 \times (22\frac{1}{2} + 18) \times 9\frac{1}{2} = 769\frac{1}{2}$, no. sq. ft. in walls.

$$22\frac{1}{2} \times 18 = 405, \text{ no. sq. ft. in ceiling.}$$

$$769\frac{1}{2} \text{ sq. ft.} + 405 \text{ sq. ft.} = 1174\frac{1}{2} \text{ sq. ft. to be plastered.}$$

$$\frac{1174\frac{1}{2} \times \$.65}{9} = \$84.83, \text{ cost of plastering.}$$

$$2 \times (22\frac{1}{2} \text{ ft.} + 18 \text{ ft.}) = 81 \text{ ft., perimeter of room.}$$

$$81 \text{ ft.} - [(8 \times 4 \text{ ft.}) + (2 \times 3\frac{1}{2} \text{ ft.})] = 62 \text{ ft. net perimeter.}$$

$$62 \text{ ft.} + 1\frac{1}{2} \text{ ft.} = 41\frac{1}{2} \text{ or } 42, \text{ no. strips for walls.}$$

$$48 \text{ ft.} + 9\frac{1}{2} \text{ ft.} = 5 \text{ whole strips from a roll.}$$

$$42 \text{ strips} + 5 \text{ strips} = 8\frac{1}{2} \text{ or } 9, \text{ no. rolls for walls.}$$

$$18 \text{ ft.} + 1\frac{1}{2} \text{ ft.} = 12, \text{ no. strips for ceiling.}$$

$$48 \text{ ft.} + 22\frac{1}{2} \text{ ft.} = 2 \text{ whole strips from a roll.}$$

$$12 \text{ strips} + 2 \text{ strips} = 6, \text{ no. rolls for ceiling.}$$

$$9 \text{ rolls} + 6 \text{ rolls} = 15 \text{ rolls for walls and ceiling.}$$

$$15 \times \$1.75 = \$26.25, \text{ cost of papering.}$$

$$18 \text{ ft.} + 2\frac{1}{2} \text{ ft.} = 8, \text{ no. of strips of carpet required.}$$

$$\frac{8 \times 22\frac{1}{2}}{3} = 60, \text{ no. yd. carpet.}$$

$$60 \times \$1.80 = \$108, \text{ cost of carpeting.}$$

$$\$84.83 + \$26.25 + \$108 = \$219.08, \text{ total cost.}$$

5. $2 \times (19\frac{1}{2} + 15) \times 9 = 621$, no. sq. ft. in walls.

$$19\frac{1}{2} \times 15 = 292\frac{1}{2}, \text{ no. sq. ft. in ceiling.}$$

$$621 \text{ sq. ft.} + 292\frac{1}{2} \text{ sq. ft.} - 100 \text{ sq. ft.} = 813\frac{1}{2} \text{ sq. ft. to be plastered.}$$

$$\frac{813\frac{1}{2} \times \$.55}{9} = \$49.71, \text{ cost of plastering.}$$

$$2 \times (19\frac{1}{2} \text{ ft.} + 15 \text{ ft.}) = 69 \text{ ft., perimeter of room.}$$

$$69 \text{ ft.} - [(3 \times 5 \text{ ft.}) + (2 \times 3 \text{ ft.})] = 48 \text{ ft., net perimeter.}$$

$$48 \text{ ft.} + 1\frac{1}{2} \text{ ft.} = 32, \text{ no. strips required.}$$

$$48 \text{ ft.} + 9 \text{ ft.} = 5, \text{ whole strips from a roll.}$$

$$32 \text{ strips} + 5 \text{ strips} = 6\frac{1}{2} \text{ or } 7, \text{ no. rolls.}$$

$$7 \times \$1.80 = \$9.10, \text{ cost of papering.}$$

$$15 \text{ ft.} + 3 \text{ ft.} = 5, \text{ no. strips of carpet required.}$$

$$\frac{5 \times 19\frac{1}{2} \text{ ft.}}{3} = 32\frac{1}{2}, \text{ no. yd. of carpet.}$$

$$32\frac{1}{2} \times \$1.10 = \$35.75, \text{ cost of carpeting.}$$

$$\$49.71 + \$9.10 + \$35.75 = \$94.56, \text{ total cost.}$$

6. $2 \times (17\frac{1}{2} + 13\frac{1}{2}) \times 7\frac{1}{2} = 472\frac{1}{2}$, no. sq. ft. in walls of sitting room.
 $2 \times (15\frac{1}{2} + 13\frac{1}{2}) \times 7\frac{1}{2} = 441\frac{1}{2}$, no. sq. ft. in walls of parlor.
 $5 \times 5\frac{1}{2} \times 3 = 86\frac{1}{2}$, no. sq. ft. in windows.
 $2 \times 6\frac{1}{2} \times 3\frac{1}{2} = 41\frac{1}{2}$, no. sq. ft. in outside doors.
 $2 \times 6\frac{1}{2} \times 3\frac{1}{2} = 39\frac{1}{2}$, no. sq. ft. in inside doors.
 $2 \times 6\frac{1}{2} \times 5\frac{1}{2} = 70\frac{1}{2}$, no. sq. ft. in double doors.
 $472\frac{1}{2} \text{ sq. ft.} + 441\frac{1}{2} \text{ sq. ft.} - 86\frac{1}{2} \text{ sq. ft.} - 41\frac{1}{2} \text{ sq. ft.} - 39\frac{1}{2} \text{ sq. ft.} - 70\frac{1}{2} \text{ sq. ft.} = 676\frac{1}{2} \text{ sq. ft. to be plastered.}$
 $676\frac{1}{2} \text{ sq. ft.} + 9 \text{ sq. ft.} = 75\frac{1}{2}$, no. sq. yd.

Page 190

7. $2 \times (12\frac{1}{2} + 8\frac{1}{2} + 12\frac{1}{2} + 6\frac{1}{2} + 15\frac{1}{2} + 8\frac{1}{2}) \times 7\frac{1}{2} = 979\frac{1}{2}$, no. sq. ft. in walls.
 $(12\frac{1}{2} \times 8\frac{1}{2}) + (12\frac{1}{2} \times 6\frac{1}{2}) + (15\frac{1}{2} \times 8\frac{1}{2}) - (3 \times 3) = 301\frac{1}{2}$, no. sq. ft. in the ceilings.
 $3 \times 5\frac{1}{2} \times 3 = 51\frac{1}{2}$, no. sq. ft. in the windows.
 $3 \times 6\frac{1}{2} \times 3\frac{1}{2} = 59\frac{1}{2}$, no. sq. ft. in the doors.
 $979\frac{1}{2} \text{ sq. ft.} + 301\frac{1}{2} \text{ sq. ft.} - (51\frac{1}{2} \text{ sq. ft.} + 59\frac{1}{2} \text{ sq. ft.}) = 1169\frac{1}{2} \text{ sq. ft. to be plastered.}$
 $1169\frac{1}{2} \text{ sq. ft.} = 130\frac{1}{2} \text{ sq. yd.}$
10. $2 \times (15\frac{1}{2} \text{ ft.} + 13 \text{ ft.}) = 56\frac{1}{2} \text{ ft.}$, perimeter of room.
 $(2 \times 3 \text{ ft.}) + (6 \times 3\frac{1}{2} \text{ ft.}) + 3\frac{1}{2} \text{ ft.} = 28\frac{1}{2} \text{ ft.}$, total width of openings.
 $56\frac{1}{2} \text{ ft.} - 28\frac{1}{2} \text{ ft.} = 28\frac{1}{2} \text{ ft.}$, net perimeter.
 $28\frac{1}{2} \text{ ft.} + 1\frac{1}{2} \text{ ft.} = 18\frac{1}{2}$ or 19, no. strips required.
 $48 \text{ ft.} + 5\frac{1}{2} \text{ ft.} = 8$ whole strips from a roll.
 $19 \text{ strips} \div 8 \text{ strips} = 2\frac{3}{4}$ or 3, no. of rolls.
 $3 \times \$.60 = \1.80 , cost.
12. $2 \times (15\frac{1}{2} \text{ ft.} + 13\frac{1}{2} \text{ ft.}) = 57 \text{ ft.}$, perimeter of room.
 $3\frac{1}{2} \text{ ft.} + 5\frac{1}{2} \text{ ft.} + (3 \times 3 \text{ ft.}) = 18 \text{ ft.}$, total width of openings.
 $57 \text{ ft.} - 18 \text{ ft.} = 39 \text{ ft.}$, net perimeter.
 $39 \text{ ft.} + 1\frac{1}{2} \text{ ft.} = 26$, no. of strips for walls.
 $48 \text{ ft.} + 7\frac{1}{2} \text{ ft.} = 6$, no. strips from a roll.
 $26 \text{ strips} \div 6 \text{ strips} = 4\frac{1}{3}$ or 5, no. rolls for walls.

$13\frac{1}{2}$ ft. \div $1\frac{1}{2}$ ft. = $8\frac{2}{3}$ or 9, no. of strips for ceiling.

48 ft. \div $15\frac{1}{2}$ ft. = 3, no. of whole strips from a roll.

9 strips \div 3 strips = 3, no. of rolls for ceiling.

$(5 + 3) \times \$1.25 = \10 , cost.

13. $2 \times (12\frac{1}{2}$ ft. $+$ $8\frac{1}{2}$ ft. $+$ $12\frac{1}{2}$ ft. $+$ $6\frac{1}{2}$ ft. $+$ $15\frac{1}{2}$ ft. $+$ $8\frac{1}{2}$ ft.) = $126\frac{1}{2}$ ft., total of perimeters.

$(3 \times 3$ ft.) $+$ $(3 \times 3\frac{1}{2}$ ft.) = $18\frac{1}{2}$ ft., total width of openings.

$126\frac{1}{2}$ ft. $-$ $18\frac{1}{2}$ ft. = $107\frac{1}{2}$ ft., net perimeter of the three rooms.

$107\frac{1}{2}$ ft. \div $1\frac{1}{2}$ ft. = $71\frac{2}{3}$ or 72, no. strips required.

$48 \div (7\frac{1}{2} + 1) = 5$ whole strips from a roll.

72 strips \div 5 strips = $14\frac{2}{5}$ or 15, no. of rolls.

Page 193

4. $18^2 + 18^2 = 648$; $\sqrt{648} = 25.45$, no. ft.

25.45 ft. $+$ 1.25 ft. (15 in.) = 26.7 ft., length of rafter.

$\frac{50 \times 26.7 \times 2 \times 900}{100} = 24,030$, or 24,250, no. shingles.

5. $12^2 + 15^2 = 369$; $\sqrt{369} = 19.2$.

19.2 ft. $+$ 1.25 ft. (15 in.) = 20.45 ft., length of rafter.

$\frac{36 \times 20.45 \times 2 \times 144}{6 \times 5} = 7068$, no. of slates.

8. $10^2 + 5^2 = 125$; $\sqrt{125} = 11.18$, no. ft., length of upper rafters.

$8^2 + 5^2 = 89$; $\sqrt{89} = 9.43$, no. ft.

9.43 ft. $+$ 1.5 ft. (18 in.) = 10.93 ft., length of lower rafters.

$\frac{59 \times 11.18 \times 2 \times 1000}{100} = 13,192.4$, or 13,193, no. of shingles for up-

per part of roof.

$\frac{59 \times 10.93 \times 2 \times 700}{100} = 9028.18$, or 9029, no. of shingles for lower part

of roof.

$13,193 + 9029 = 22,222 = 22,250$, no. of shingles required.

Page 194

4. 100 ft. $+$ 75 ft. $-$ 6 ft. = 169 ft., length of walk.

$\frac{169 \times 6 \times \$3.75}{9} = \$422.50$, cost.

Page 196

2. 32's means 32 pages on one side of a sheet.

32 pages = 8 pages by 4 pages.

 $8 \times 5'' = 40''$, length of sheet. $4 \times 6\frac{1}{4}'' = 27''$, width of sheet.Hence, the size $28'' \times 42''$ is best.

Each sheet prints 4 signatures ; hence one volume requires 6 sheets.

$$\frac{100 \times 480}{6} = 8000 \text{ volumes.}$$

- 3.
- $\frac{50 \times 70 \times 28 \times 42 \times \$85}{26 \times 38 \times 2000} = \177.05
- , cost.

Page 197

- 4.
- $2000 \times \$.15 = \300
- , cost of paper.

$$\frac{17 \times 22}{8\frac{1}{2} \times 5\frac{1}{4}} = 8, \text{ no. of leaves from one sheet.}$$

$$\frac{2000 \times 12 \times 8}{32} = 6000, \text{ no. of notebooks.}$$

 $\$60$ = cost of manufacturing. $6000 \times \$.10 = \600 , selling price of notebooks. $\$600 - (\$300 + \$60) = \240 , profit.

- 5.
- $\frac{50 \times 80 \times 8 \times 10\frac{1}{2}}{16 \times 21} = 1000$
- , no. lb. in 80 reams
- $8'' \times 10\frac{1}{2}''$
- .

5% of 1000 lb. = 50 lb., discrepancy allowed.

1075 lb. - (1000 lb. + 50 lb.) = 25 lb., weight overcharged.

 $25 \times \$.22 = \5.50 , amount overcharged.

- 7.
- $\frac{24 \times 500 \times 17 \times 22 \times \$1.10}{480 \times 5\frac{1}{2} \times 8\frac{1}{2}} = \220
- .

- 9.
- $\frac{500 \times 160 \times 10 \times 14}{500 \times 20 \times 28} = 40$
- , no. reams.

10. 32's means 32 pages on one side of a sheet.

32 pages = 4 pages by 8 pages.

 $4 \times 8\frac{1}{2}'' = 34''$, width of sheet. $8 \times 5\frac{1}{2}'' = 44''$, length of sheet.Hence the size $35'' \times 46''$ would be used.

$$\frac{50 \times 167 \times 35 \times 46 \times \$100}{25 \times 38 \times 2000} = \$707.55, \text{ cost.}$$

26. $649,728 \div (48 \times 48 \times 5\frac{1}{4}) = 48$, no. feet deep.

Page 209

$$\begin{array}{r}
 2. \$ 82.28 \\
 126.96 \\
 149.47 \\
 \underline{56.99} \\
 \$ 415.70
 \end{array}$$

Page 210

$$\begin{array}{r}
 1. \$ 43.88 \\
 152.88 \\
 346.75 \\
 \underline{15.44} \\
 \$ 558.95
 \end{array}$$

Page 210 (continued)

5. $\frac{5 \times 60 \times 60 \times 8 \times 14}{12 \times 12} = 14,000$, no. cu. ft. per hour.
8. $44 \times 18 \times \$.193 = \$ 152.86$, cost.
 18 Hl. = 1800 liters.
 $1800 \times .908 \text{ qt.} = 1634.4 \text{ qt.}$
 $1634.4 \times \$.12 = \$ 196.13$, selling price.
 $\$ 196.13 - \$ 152.86 = \$ 43.27$, gain.
9. $\frac{.95 \times 1.8 \times 1.2 \times 1000 \times 1.0567 \text{ qt.}}{4} = 542.087$, no. gal.
 $542.087 \times \$.20 = \$ 108.42$, value.
10. $2 \times (80 + 56) \times 16\frac{1}{2} \text{ ft.} + (4 \times 8 \text{ ft.}) = 4520 \text{ ft.}$, length of walk.
 $\frac{4520 \times 8 \times 144 \times \$ 7.50}{4 \times 8 \times 1000} = \$ 1220.40$, cost.

Page 217

10. $40 \times \$.24 = \$ 9.60$, cost.
 80% of 40 doz. = 32 doz. to sell.
 $116\frac{2}{3}\%$ of $\$ 9.60 = \$ 11.20$, necessary selling price to gain $16\frac{2}{3}\%$.
 $\$ 11.20 \div 32 = \$.35$, selling price per dozen.
12. $860 \times \$ 3.86 = \$ 3319.60$, prime cost.
 $860 \times 22.40 \text{ cwt.} = 19,264 \text{ cwt.}$
 $19,264 \times \$.06 = \$ 1155.84$, freight.
 $\$ 3319.60 + \$ 1155.84 + \$ 321.60 = \$ 4797.04$, gross cost.
 122% of $\$ 4797.04 = \$ 5852.39$, selling price of all.
 $19,264 \text{ cwt.} \div 20 \text{ cwt.} = 963.2$, no. short tons.
 $\$ 5852.39 \div 963.2 = \$ 6.08$, selling price per short ton.

Page 219

7. 6% of \$4000 = \$240, int. on mortgage.
 \$800 - (\$240 + \$200) = \$360, net income.
 \$360 ÷ \$4000 = .09 = 9%, int. on investment.
8. 15,497 + 63,695 + 189,756 + 60,029 = 328,977, total.
 15,497 ÷ 328,977 = .047 = 4.7%, employed 1-29 days.
 63,695 ÷ 328,977 = .194 = 19.4%, employed 30-59 days.
 189,756 ÷ 328,977 = .577 = 57.7%, employed 60-79 days.
 60,029 ÷ 328,977 = .182 = 18.2%, employed 80 da. or more.
 Total = 100%.

Page 221

13. 82,809 tons ÷ 74 = 1119 tons, average 1910.
 51,087 tons ÷ 56 = 912 tons, average 1909.
 1119 tons - 912 tons = 207 tons, average increase.
 207 ÷ 912 = .227 = 22.7%, increase.

Page 224

6. \$45.12 ÷ \$.32 = 141, no. doz. sold.
 141 doz. ÷ .94 = 150, no. doz. in consignment.
7. \$28,460.50 + \$35,827.43 + \$46,921.07 = \$111,209, total for 3 mo.
 \$111,209 ÷ .35 = \$317,740, sales for 1 yr.
 \$317,740 - \$111,209 = \$206,531, sales for 9 mo.
 \$206,531 ÷ 9 = \$22,947.89, average sales per mo. for remainder of yr.
11. 1.00 of first year's sales = first year's sales.
 1.15 of first year's sales = second year's sales.
 120% of 1.15 of first year's sales = 1.38 of first year's sales = third year's sales.
 125% of 1.38 of first year's sales = 1.72½ of first year's sales = fourth year's sales.
 Hence 1.72½ of first year's sales = \$29,023.13.
 \$29,023.13 ÷ 1.72½ = \$16,825, first year's sales.
12. 1.00 of first year's sales = first year's sales.
 1.16½ of first year's sales = second year's sales.
 120% of 1.16½ of first year's sales = 1.40 of first year's sales = third year's sales.

125% of 1.40 of first year's sales = 1.75 of first year's sales = fourth year's sales.

114 $\frac{2}{3}$ % of 1.75 of first year's sales = 2.00 of first year's sales = fifth year's sales.

(1.00 + 1.16 $\frac{2}{3}$ + 1.40 + 1.75 + 2.00) of first year's sales = 7.31 $\frac{1}{3}$ of first year's sales = total sales.

Hence 7.31 $\frac{1}{3}$ of first year's sales = \$213,244.25.

\$213,244.25 + 7.31 $\frac{1}{3}$ = \$29,145, first year's sales.

13. 1.00 of October's sales = October's sales.

1.25 of October's sales = November's sales.

120% of 1.25 of October's sales = 1.50 of October's sales = December's sales.

60% of 1.50 of October's sales = .90 of October's sales = January's sales.

Hence .90 of October's sales = \$3501.

\$3501 + .90 = \$3890, sales for October.

Page 229

2. 1% of \$18,000 = \$180, repairs.

1 $\frac{1}{4}$ % of \$18,000 = \$270, taxes.

$\frac{1}{4}$ % of \$10,000 = \$25, insurance.

\$180 + \$270 + \$25 + \$85 = \$560, total expense.

\$2000 - \$560 = \$1440, net income.

\$1440 + \$2000 = 72% of gross rental.

\$1440 + \$18,000 = 8% of value of store.

10. 1.00 of cost of first = cost of first.

1.50 of cost of first = cost of second.

2.50 of cost of first = cost of first two.

70% of 2.50 of cost of first = 1.75 of cost of first = cost of third.

(2.50 + 1.75) of cost of first = 4.25 of cost of first = cost of all three.

Hence 4.25 of cost of first = \$12,750.

\$12,750 + 4.25 = \$3000, cost of first.

150% of \$3000 = \$4500, cost of second.

\$12,750 - (\$3000 + \$4500) = \$5250, cost of third.

Page 231

20. $\$15 + \$60 + \$45 = \120 , total annual expense.
 7% of $\$6000 = \420 , net rental.
 $\$420 + \$120 = \$540$, gross rental.
 $\$540 \div 12 = \45 , monthly rental.

Page 235

1. 24 doz. @ $\$10 = \240
 12 doz. @ $\$14 = \168
 $\$408$
 20% $\$826.40$
 8 doz. @ $\$12 = \96 .
 25/10% 64.80 $\$391.20$

Page 236

2. 8 rugs @ $\$35 = \280
 6 rugs @ 45 = 270
 210 yd. @ 1.25 = 262.50
 $\$812.50$
 16 $\frac{1}{2}$ /10% $\$609.38$
 Less 1% 6.00
 $\$603.29$
3. 20 mats, 1500 # @ $\$.25 = \375
 30 bags, 3750 # @ .20 = 750
 30 bags, 3750 # @ .15 = 562.50
 $\$1687.50$
 15/10% $\$1290.94$
- 25 hf. ch., 1875 # @ $\$.25 = \468.75
 30 hf. ch., 1500 # @ .45 = 675.00
 25 hf. ch., 1500 # @ .30 = 450.00
 $\$1593.75$
 20/10% $\$1147.50$
 $\$2438.44$
 Less 5% 121.92 $\$2316.52$

Page 237

4. 100 cases, 3600 pr. @ \$ 2.50 = \$ 9000
 80 cases, 2880 pr. @ 2.25 = 6480
 60 cases, 2160 pr. @ 2.25 = 4860
 120 cases, 4320 pr. @ 3.50 = 15120
\$ 35460
 25/12½ % \$ 23270.63
 Less 5 % 1163.53
\$ 22107.10
5. 160 yd. @ \$ 3.50 = \$ 560
 120 yd. @ 2.25 = 270
 240 yd. @ 2.50 = 600
 80 yd. @ 1.75 = 140
\$ 1570
 33½/12½/5 % \$ 870.04
6. 18 @ \$ 2.25 = \$ 40.50
 24 @ 4.50 = 108
 4 @ 7.00 = 28
 12 @ 3.50 = 42
\$ 218.50
 37½/25/10 % \$ 92.18
7. 24 @ \$ 4.50 = \$ 108.00
 30 @ 5.40 = 162.00
 18 @ 1.25 = 22.50
 20 @ 1.25 = 25.00
\$ 317.50
 20/12½ % \$ 222.25
8. 1800 yd. @ \$.12 = \$ 216
 1400 yd. @ .50 = 700
 2000 yd. @ 1.10 = 2200
 3000 yd. @ .62½ = 1875
\$ 4991
 20/12½ % \$ 3493.70
9. 360 yd. @ \$ 1.20 = \$ 432
 800 yd. @ .75 = 600
 1200 sq. yd. @ .62½ = 750
 900 yd. @ 1.25 = 1125
\$ 2907
 22½/5 % \$ 2140.28

$$\begin{array}{r}
 10. \quad 5 \mid \$650 \\
 \quad \quad 130 \\
 \hline
 3 \mid \$520 \\
 \quad \quad 173.88 \\
 \hline
 \quad \$846.67, \text{ cost, first.}
 \end{array}$$

$$\begin{array}{r}
 5 \mid \$700 \\
 \quad \quad 140 \\
 \hline
 8 \mid \$560 \\
 \quad \quad \$70 \\
 \quad \quad 5 \\
 \hline
 20 \mid \$350 \\
 \quad \quad 17.50 \\
 \hline
 \quad \$332.50, \text{ cost, second.}
 \end{array}$$

$$\$846.67 - \$332.50 = \$514.17, \text{ second better.}$$

Page 238

$$\begin{array}{r}
 11. \quad 4 \mid \$1480 \\
 \quad \quad 370 \\
 \hline
 3 \mid \$1110 \\
 \quad \quad 370 \\
 \hline
 5 \mid \$740 \\
 \quad \quad 148 \\
 \hline
 \quad \$592, \text{ net amount, first.}
 \end{array}$$

$$\begin{array}{r}
 5 \mid \$1480 \\
 \quad \quad 296 \\
 \hline
 8 \mid \$1184 \\
 \quad \quad 148 \\
 \hline
 \quad \$1036 \\
 \quad \quad .60 \\
 \hline
 \quad \$621.60, \text{ net amount, second.}
 \end{array}$$

$$\$621.60 - \$592 = \$29.60, \text{ first better.}$$

$$\begin{array}{r}
 12. \quad 4 \mid \$450 \\
 \quad \quad 112.50 \\
 \hline
 8 \mid \$337.50 \\
 \quad \quad 42.19 \\
 \hline
 \quad \$295.31, \text{ net.}
 \end{array}$$

$$\begin{array}{r}
 12 \mid \$375.60 \\
 \quad \quad 31.30 \\
 \hline
 8 \mid \$344.30 \\
 \quad \quad \$43.03\frac{1}{2} \\
 \quad \quad 5 \\
 \hline
 \quad \$215.19, \text{ net}
 \end{array}$$

$$\begin{array}{r}
 6 \mid \$434.90 \\
 \quad \quad 72.48 \\
 \hline
 \quad \$362.42, \text{ net.}
 \end{array}$$

$$\$295.31 + \$215.19 + \$362.42 = \$872.92, \text{ net amount.}$$

$$\begin{array}{r}
 13. \quad 4 \mid \$80 \\
 \quad \quad 20 \\
 \hline
 5 \mid \$60 \\
 \quad \quad 12 \\
 \hline
 \quad \$48 \\
 \quad \quad \$92.24
 \end{array}$$

$$\begin{array}{r}
 6 \mid \$126.50 \\
 \quad \quad 21.08 \\
 \hline
 8 \mid \$105.42 \\
 \quad \quad 13.18 \\
 \hline
 \quad \$92.24
 \end{array}$$

$$\begin{array}{r}
 4 \mid \$172.75 \\
 \quad \quad 43.1875 \\
 \hline
 8 \mid \$129.5625 \\
 \quad \quad \$16.1953 \\
 \quad \quad 3 \\
 \hline
 \quad \$48.5859
 \end{array}$$

$$\begin{array}{r}
 \$48.00 \\
 \quad 92.24 \\
 \hline
 \quad 48.59 \\
 20 \mid 188.83 \\
 \quad \quad 9.44 \\
 \hline
 \quad \$179.39, \text{ net amount.}
 \end{array}$$

Page 240

6. $400 \times \$18 \times \frac{1}{2} \times \frac{1}{10} = \5472 , net cost, A.
 $\$5472 + \$4.50 = \$5476.50$, cost, A.
 $400 \times \$16 \times \frac{2}{10} = \5760 , cost, B.
 $\$5760 - \$5476.50 = \$283.50$, A's offer is better.
8. $\$150 \times \frac{1}{2} \times \frac{1}{2} = \80 .
 $\$125 \times \frac{1}{2} \times \frac{1}{2} = \82.03 .
 2% of $\$80 = \1.60 .
 $\$80 - \$1.60 = \$78.40$, net cost.

Page 242

- § 576. 4. $12\frac{1}{2}\%$ of $\$1380 = \172.50 , loss on sale.
 60% of $\$375 = \225 , loss by bad debt.
 $\$172.50 + \$225 = \$397.50$, total loss.
6. $6 \times 125 \times \$.12 = \90 , cost of Rio.
 $9 \times 75 \times \$.20 = \135 , cost of Java.
 $\$90 + \$135 = \$225$, total cost.
 $(6 \times 125 \text{ lb.}) + (9 \times 75 \text{ lb.}) = 1425 \text{ lb.}$
 190% of $\$225 = \427.50 , selling price of all.
 $\$427.50 + 1425 = \$.30$, selling price per pound.

Page 243

- § 576. 9. $\$3 \times \frac{1}{2} \times \frac{1}{10} = \2.25 , prime cost.
 $\$2.25 + \$.05 = \2.30 , total cost.
 40% of $\$2.30 = \$.92$, gain.
 $\$2.30 + \$.92 + \$.28 = \3.50 , selling price per pair.

Page 245

7.

Returns

Merchandise sales

\$45000

Cost

Merchandise inventory at beginning,

\$ 5400

Merchandise purchases,

38000

Merchandise, total cost,

\$43400

Less inventory at closing,

7400

Net cost of sales,

\$ 36000

Merchandise, gain,

\$ 9000

 $\$9000 \div \$36000 = .25 = 25\%$ gain.

8.

Cost

Merchandise, inventory January 1, 1909,	\$ 7925.00	
Merchandise, purchases, Jan. 1-Dec. 31,	<u>53796.50</u>	
Merchandise, total cost,	\$ 61721.50	
Less inventory December 31, 1909,	<u>1721.50</u>	
Net cost of sales,		\$ 60000.00
Merchandise sales Jan. 1-Dec. 31,		<u>54837.50</u>
Merchandise, loss,		\$ 5162.50
\$ 5162.50 ÷ \$ 60000 = .086 = 8.6% loss.		

9. $6 \times 28 \times \$.08 = \$ 13.44$, cost.

$$\frac{6 \text{ reams} \times 17 \times 22}{8\frac{1}{2} \times 11} = 24 \text{ reams } (8\frac{1}{2} \text{ in.} \times 11 \text{ in.}).$$

$$24 \times \$ 1.00 = \$ 24$$
, selling price.

$$\$ 24 - \$ 13.44 = \$ 10.56$$
, gain.

$$\$ 10.56 \div \$ 13.44 = .786 = 78.6\% \text{ gain.}$$

10. $\$.30625 - \$.245 = \$.06125$, gain.

$$\$.06125 \div \$.245 = 25\%$$
, gain.

$$25\% \text{ of } \$.288 = \$.072$$
, gain.

$$\$.288 + \$.072 = \$.36$$
, necessary selling price.

Page 246

2. $\$ 18 \div .25 = \$ 72$, net cost.

$$\$ 72 \div (80\% \text{ of } .90) = \$ 100$$
, list price.

4. Let 1.00 of cost of first lot = cost of first lot.

$$.20 \text{ of cost of first lot} = \text{gain on first lot.}$$

$$1.20 \text{ of cost of first lot} = \text{selling price of first lot} = \text{cost of second lot.}$$

$$.20 \text{ of cost of first lot} = (16\frac{2}{3} \text{ of } 1.20), \text{ gain on second lot.}$$

$$1.40 \text{ of cost of first lot} = \text{selling price of second lot.}$$

$$(1.40 - 1.00) \text{ of cost of first lot} = .40 \text{ of cost of first lot, gain on both.}$$

$$\text{Hence } 40\% \text{ of cost of first lot} = \$ 1400.$$

$$\$ 1400 \div .40 = \$ 3500$$
, cost of first lot.

$$120\% \text{ of } \$ 3500 = \$ 4200$$
, cost of second lot.

5. 20% of $\$12.50 = \2.50 , loss on pineapples.
 $\$2.50 \div .10 = \25 , cost of pineapples.
 $\$12.50 + \$2.50 = \$15$, gain on oranges.
 $\$15 \div .25 = \60 , cost of oranges.
6. Let 100% of estimated value = estimated value.
 Then 90% of estimated value = cost.
 110% of estimated value = selling price.
 $(110\% - 90\%)$ of estimated value = 20% of estimated value = gain.
 Hence 20% of estimated value = $\$800$.
 $\$800 \div .20 = \4000 , estimated value.
 90% of $\$4000 = \3600 , cost.
 $\$800 + \$3600 = 22\frac{2}{3}\%$, rate of profit.
7. $\$.485 \times \frac{4}{5} \times \frac{7}{8} = \$.3182\frac{1}{8}$, cost.
 $\$.485 \times \frac{4}{5} \times \frac{9}{10} = \$.3637\frac{1}{2}$, selling price.
 $\$.3637\frac{1}{2} - \$.3182\frac{1}{8} = \$.0454\frac{1}{8}$, gain.
 $\$.0454\frac{1}{8} \div \$.3182\frac{1}{8} = 14.29\%$, gain.
 $\$.485 \times \frac{4}{5} \times \frac{9}{10} = \$.3492$, cost with 20% and 10% off.
 14.29% of $\$.3492 = \$.0499$, gain on new cost.
 $\$.3492 + \$.0499 = \$.3991$, net selling price to gain same rate
 $\$.485 - \$.3991 = \$.0859$, discount.
 $\$.0859 \div \$.485 = 17.7\%$, rate to be allowed.

Page 248

6. 80% of $\$65 = \52 , net selling price.
 $\$52 \div 1.33\frac{1}{3} = \39 , necessary buying price.
 75% of $\$65 = \48.75 , cost with 25% off.
 $\$48.75 - \$39 = \$9.75$, additional discount necessary.
 $\$9.75 \div \$48.75 = 20\%$, additional rate of discount.
7. $\$35 \div 1.25 = \28 , wholesaler's selling price.
 $\$28 \div 1.16\frac{2}{3} = \24 , manufacturer's selling price.
 $\$24 \div 1.20 = \20 , first cost.
8. $\$4800 \div 1.20 = \4000 , cost of one.
 $\$4800 \div .80 = \6000 , cost of other.
 $(\$6000 + \$4000) - (2 \times \$4800) = \400 , loss.
 $\$400 \div \$10,000 = .04$ or 4% , loss.

10. $\$64 \times \frac{1}{4} \times \frac{1}{2} = \40 , net selling price.
 $\$40 \div 1.33\frac{1}{3} = \30 , cost.
 $\$30 + .75 = \40 .
 $\$40 \div .83\frac{1}{3} = \48 , list price.

Page 251

7. Let 100% of cost of 1st horse = cost of 1st horse.
 25% of cost of 1st horse = gain on 1st horse.
 125% of cost of 1st horse = selling price of 1st horse = cost of 2d horse.
 15% of cost of 1st horse = (12% of 125%) = loss on 2d horse.
 110% of cost of 1st horse = selling price of 2d horse.
 (110% - 100%) of cost of 1st horse = 10% of cost of 1st horse = gain.
 Hence, 10% of cost of 1st horse = \$22.50.
 $\$22.50 \div .10 = \225 , cost of 1st horse.
8. 100% of cost = cost = selling price of 75% of goods.
 75% of cost = cost of part sold.
 25% of cost = gain.
 $25\% \text{ of cost} + 75\% \text{ of cost} = 33\frac{1}{3}\%$, rate of gain.
 $100\% \text{ of cost} + 25\% \text{ of cost} = 125\% \text{ of cost} = \text{selling price of all.}$
 $125\% \text{ of cost} - 100\% \text{ of cost} = 25\%$, gain on all.
9. $100\% - (25/20\%) = 60\%$, net cost.
 $133\frac{1}{3}\% \text{ of } 60\% = 80\%$ of list price necessary to sell at.

Page 252

11. $100\% - (25/20\%) = 60\%$, net cost.
 $125\% \text{ of } 60\% = 75\%$.
 Hence, each article should be sold at 75% of the buying list price
 $75\% \text{ of } \$45.00 = \33.75 , selling price roll top desks.
 $75\% \text{ of } 25.00 = 18.75$, selling price flat top desks.
 $75\% \text{ of } 37.50 = 28.13$, selling price china closets.
 $75\% \text{ of } 62.50 = 46.88$, selling price sideboards.
 $75\% \text{ of } 25.00 = 18.75$, selling price dining tables.
 $75\% \text{ of } 20.00 = 15.00$, selling price set dining chairs.

16. $3 \times (\$28 - \$16.80) = \$33.60$, gain per day (at \$28).
 $12 \times (\$21 - \$16.80) = \$50.40$, gain per day (at \$21).
 $\$50.40 - \$33.60 = \$16.80$, increase in gain.
 $\$16.80 \div \$33.60 = 50\%$, increase.
18. $2240 \text{ lb.} + 2000 \text{ lb.} = 1.12$, no. short tons in one long ton.
 $1.12 \times (\$6.50 - \$.80) = \$6.384$, net return from 1 long ton.
 $\$6.384 - \$4.75 = \$1.634$, gain on one long ton.
 $\$1.634 \div \$4.75 = .344 = 34.4\%$, gain.

Returns

19. Merchandise sales,	\$ 62500	
Freight on above,	<u>850</u>	
Net returns,		\$ 61650

Cost

Merchandise, inventory at beginning,	\$ 16800	
Merchandise purchases,	47500	
Freight on purchases,	<u>700</u>	
Merchandise, total cost,	\$ 65000	
Merchandise, inventory at closing,	<u>19500</u>	
Cost of sales,		\$ 45500
Merchandise gain,		\$ 16150
$\$16150 \div \$45500 = .355 = 35.5\%$, gain.		

Investments

21. $11 \times \$8000 = \88000 , for one month.
 $6 \times 4000 = 24000$, for one month.
 $5 \times 2000 = \underline{10000}$, for one month.
Total = \$122000, for one month.

Withdrawals

- $9 \times \$1000 = \9000 , for one month.
 $2 \times 3000 = \underline{6000}$, for one month.
Total = \$15000, for one month.
 $\$122000 - \$15000 = \$107000$, net investment for one month.
 $\$107000 \div 11 = \9727.27 , net average investment.
 $\$3475 \div \$9727.27 = .357 = 35.7\%$, gain.

Page 254

24. $\$3200 + \$9600 - \$450 - \$4500 = \$7850$, cost of sales.
 $\$10500 - \$600 = \$9900$, net amount of sales.
 $\$9900 - \$7850 = \$2050$, gain.
 $\$2050 \div \$7850 = .261 = 26.1\%$, gain.

Page 256

- $\$40 \times \frac{3}{4} \times \frac{3}{4} = \24 , net cost to jobber.
 $\$24 \times \frac{4}{3} \times \frac{4}{3} \times \frac{4}{3} = \50 , jobber's marked price.
- 60% of $\$35 = \21 , net cost to retailer.
 $\$21 \times \frac{4}{3} \times \frac{4}{3} = \42 , retailer's marked price.
- $\$10.80 \times \frac{3}{4} \times \frac{3}{4} = \6.48 , net cost of one yard.
 $\$6.48 \div \frac{3}{4} \times \frac{4}{3} = \9.00 , retailer's marked price.
- 80% of $83\frac{1}{3}\%$ of l. p. = $66\frac{2}{3}\%$ of l. p., net cost per cent.
 $133\frac{1}{3}\%$ of $66\frac{2}{3}\%$ of l. p. = $88\frac{2}{3}\%$ of l. p., selling price per cent.
 $88\frac{2}{3}\%$ of $\$4.50 = \4.00 ; $\$4.00 \div 12 = \$.33$, selling price.
 $88\frac{2}{3}\%$ of $\$15.00 = \13.33 ; $\$13.33 \div 12 = \1.11 , selling price.
 $88\frac{2}{3}\%$ of $\$10.50 = \9.33 ; $\$9.33 \div 12 = \$.78$, selling price.
 $88\frac{2}{3}\%$ of $\$18.00 = \16.00 ; $\$16.00 \div 12 = \1.33 , selling price.
 $88\frac{2}{3}\%$ of $\$15.75 = \14.00 ; $\$14.00 \div 12 = \1.17 , selling price.

Page 257

5. 18 chiffoniers @ $\$22.50 = \405.00

10/5 %	\$ 346.28
Less 3 %	10.39
	<hr/>
	\$ 335.89
Freight	13.61
	<hr/>
	\$ 349.50

120% of $\$349.50 = \419.40 , selling price of all.

$\$419.40 \div 18 = \23.30 , selling price of one.

6. 80% of 90% of l. p. = 72% of l. p., net cost per cent.
130% of 72% of l. p. = 93.6% of l. p., selling price per cent.

93.6% of \$12.50 = \$11.70; $\$11.70 \div 12 = \$.98$, selling price of shovels.

93.6% of \$15.00 = \$14.04; $\$14.04 \div 12 = \1.17 , selling price of wheelbarrows.

93.6% of \$.25 = \$.23, selling price per foot of lead pipe.

7. $\$48 \times \frac{1}{2} \times \frac{1}{4} = \32 , net cost per dozen.

$\$32 \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \4.80 , list price of one.

8. $\$9.00 \times \frac{1}{2} \times \frac{1}{2} = \6.80 , net cost per dozen.

$\$6.80 \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \$.72$, marked price of one.

9. $\frac{12 \times 15}{9} = 20$, no. sq. yd.

$5 \times \$4.8665 = \24.33 , prime cost.

$20 \times \$.90 = \18 , duty.

40% of \$24.00 = \$9.60, duty.

$\$24.33 + \$18 + \$9.60 = \51.93 , gross cost.

125% of \$51.93 = \$64.91, selling price.

Page 260

22. 25 tons hay @ \$15.00 = \$375.00

35 tons hay @ 15.50 = 542.50

40 tons hay @ 14.75 = 590.00 \$1507.50

Charges

Freight, \$100; Cartage, \$75;

Insurance, \$5.00, \$180

Storage, 10

Commission, 50¢ a ton, 50 \$240.00

Net Proceeds, \$1267.50

23. 1200 bu. corn @ 60¢ = \$720

900 bu. corn @ 62¢ = 558

900 bu. corn @ 61¢ = 549 \$1827.00

Charges

Freight, 2¢ a bu., \$60.00

Cartage, 3¢ a bu., 90.00

Insurance, 7.50

Storage, 15.00

Commission, 2¢ a bu. 60.00 \$232.50

Net proceeds, \$1594.50

24.	65 bbl. flour @	\$ 6.40 =	\$ 416.00	
	185 bbl. flour @	6.45 =	1193.25	
	50 bbl. flour @	6.35 =	317.50	
	160 bbl. flour @	6.50 =	<u>1040.00</u>	\$ 2966.75

Charges

Freight, \$56 ; Cartage, \$14 ;		
Cooperage, \$3.70 ; Ad-		
vertising, \$11.50,	\$ 85.20	
Storage,	15.80	
Commission, 2 %,	59.34	
Guaranty, 1 %,	<u>29.67</u>	\$ 190.01
Net proceeds,		<u>\$ 2776.74</u>

25. $460 \times 5\frac{1}{2} \times \$.80 = \$ 2024$, cost of the wheat.
 $\$.15 + \$.35 = \$.50$, cost of barrel, and grinding 1 bbl. of flour.
 $460 \times \$.50 = \$ 230$, cost of barrels and grinding all,
 $\$ 2024 + \$ 230 = \$ 2254$, gross cost.
 $\$ 2776.74 - \$ 2254 = \$ 522.74$, gain.
 $\$ 522.74 \div \$ 2254 = .232 = 23.2 \%$, gain.

Page 261

26.	25 M white pine lumber	@ \$ 36,	\$ 900	
	30 M Georgia pine ceiling	@ \$ 45,	1350	
	18 M hemlock boards	@ \$ 16,	288	
	22 M white oak	@ \$ 48,	<u>1056</u>	\$ 3594.00

Charges

Cartage,	\$ 125.00	
Commission, $2\frac{1}{2} \%$,	<u>89.85</u>	<u>214.85</u>
Amount charged to your account,		<u>\$ 3808.85</u>

27.	100 gal. oysters	@ \$.75 =	\$ 75	
	200 doz. clams	@ .08 =	16	
	600 lb. bluefish	@ .05 =	30	
	800 lb. whitefish	@ .08 =	<u>64</u>	\$ 185.00

Charges

Commission, 3 %,	\$ 5.55	
Drayage,	<u>4.50</u>	<u>10.05</u>
Amount charged to your account,		<u>\$ 195.05</u>

Page 263

2. $\$12.50 + \$3.35 = \$15.85$, charges, except commission.
 $\$864.55 - \$15.85 = \$848.70$, prime cost plus commission.
 $102\frac{1}{2}\%$ of $\$.72 = \$.738$, cost of 1 bu. potatoes plus commission.
 $\$848.70 \div \$.738 = 1150$, no. bu.
6. $180 \times 275 \times \$.05\frac{1}{2} = \2598.75 , prime cost.
 2% of $\$2598.75 = \51.98 commission.
 $\$2598.75 + \$51.98 + \$71.77 = \2722.50 , gross cost.
 $180 \times 275 \times \$.06 = \2970 , selling price.
 $\$2970 - \$2722.50 = \$247.50$, gain.
 $\$247.50 \div \$2722.50 = 9\frac{1}{11}\%$, gain.
7. $6500 \times \$.60 = \3900 , gross proceeds.
 $6500 \times \$.03 = \195 , commission.
 $6500 \times \$.02 = \130 , freight.
 $\$3900 - (\$195 + \$130 + \$85) = \$3490$, net proceeds.
 105% of $\$2475 = \2598.75 , gross cost of silk.
 $\$3490 - \$2598.75 = \$891.25$, amount remitted.

Page 264

8. $133\frac{1}{3}\%$ of $\$18 = \24 , net returns from sale.
 15% (com.) + 5% (bad debts) = 20% .
 $\$24 \times \frac{2}{3} \times \frac{3}{4} = \40 , marked price.
9. $\$800 \times \frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} = \1600 , catalogue price.
10. $400 \times 500 \times \$.1252 = \$25,040$, gross proceeds.
 $4 \times \$5 = \20 , commission.
 $\$25,040 - \$20 = \$25,020$, net proceeds.
 2% of $\$5 = \$.10$, commission on 1 bbl. flour.
 $\$5 + \$.10 = \$5.10$, gross cost of 1 bbl. flour.
 $\$25,020 \div \$5.10 = 4905$, no. bbl., $\$4.50$ unexpended.
11. 3% of $\$2.40 = \$.072$, commission on 1 bbl.
 2% of $\$2.40 = \$.048$, guaranty on 1 bbl.
 $\$2.40 + \$.072 + \$.048 + \$.05 + \$.12 = \2.69 , gross cost of 1 bbl.
 $\$7500 \div \$2.69 = 2788$ bbl., $\$.28$ unexpended.
 $2788 \times \$.072 = \200.74 , commission.
12. $2\frac{1}{2}\%$ of $\$8000 = \200 , each, commission and guaranty.
 $\$8000 - (\$200 + \$200 + \$162.50 + \$68.50) = \7369 , net proceeds.

13. 225 bbl. flour	@ \$6.75 =	\$1518.75	
300 bbl. flour	@ 6.85 =	2055.00	
315 bbl. flour	@ 6.80 =	<u>2142.00</u>	\$5715.75

Charges

Freight,	\$131.50	
Drayage,	210.00	
Advertising,	27.50	
Insurance, $\frac{1}{4}\%$,	14.29	
Storage,	16.74	
Commission, $2\frac{1}{4}\%$,	<u>128.60</u>	528.63
Net proceeds,		<u>\$5187.12</u>

14. 42 Ideal refrigerators	@ \$17.50,	\$735.00	
24 dining tables	@ 26.40,	633.60	
18 dressers	@ 32.75,	<u>589.50</u>	\$1958.10

Charges

Drayage,	\$15.00	
Commission, 5%,	<u>97.91</u>	112.91
Amount charged to your account,		<u>\$2071.01</u>

Page 266

- § 613. 4. $122\frac{1}{2}\%$ of \$3000 = \$3675, capital beginning 2d year.
 180% of \$3675 = \$4777.50, capital beginning 3d year.
 $88\frac{1}{2}\%$ of \$4777.50 = \$8981.25, capital end 3d year.
 \$8981.25 - \$3000 = \$5981.25, gain in 3 years.

Page 267

9. 600 pr.	@ \$2.75 =	1650.00.	
25/10%			\$1113.75
175 doz.	@ \$3.25 =	\$568.75.	
20/12 $\frac{1}{2}\%$			398.13
15 doz.	@ \$14.50 =		<u>217.50</u>
			\$1729.38
Less 2%,			<u>84.59</u>
Net cost,			<u>\$1694.79</u>

- 98% of \$1113.75 = \$1091.48, net cost of barndoor hangers.
 125% of \$1091.48 = \$1364.35, selling price of 600 pr.
 \$1364.35 ÷ 600 = \$2.27, selling price per pair, barndoor hangers.

98 % of \$398.13 = \$390.17, net cost of strap hinges.

125 % of \$390.17 = \$487.71, selling price of 175 dozen.

\$487.71 ÷ 175 = \$2.79, S. P. per doz. or 28 ¢ each, strap hinges.

98 % of \$14.50 = \$14.21, net cost per doz. W. I. wrenches.

125 % of \$14.21 = \$17.76, S. P. per doz. or \$1.48 each, W. I. wrenches.

10. $148 \times \$15 = \2220 , total receipts.

$15 \times \$6.25 = \93.75 , coal.

$\$93.75 + \$31.40 + \$78.60 + \$15.20 + \$47.80 = \266.75 , total expenses.

$\$2220 - \$266.75 = \$1953.25$, net receipts.

$\$1953.25 \div \$3000 = 65.1\%$, profit.

Page 268

7. $300 \times 180,560 \text{ lb.} = 54,168,000 \text{ lb.}$ used annually.

15 % of 54,168,000 lb. = 8,125,200 lb. oil.

38 % of 54,168,000 lb. = 20,583,840 lb. oil cake.

$1\frac{1}{2}\%$ of 54,168,000 lb. = 812,520 lb. linter.

$(8,125,200 \div 36) \times \$2.25 = \$507,825$, from oil.

$(20,583,840 \div 36) \times \$2.20 = \$114,354.67$, from oil cake.

$(812,520 \div 36) \times \$4.50 = \$101,565$, from linter.

$\$507,825 + \$114,354.67 + \$101,565 = \$723,744.67$, total amount received.

Page 282

27. $\$646,250,150 + \$54,631,980 + \$30,000,000 = \$730,882,130$ at 2%.

$\frac{\$730,882,130 \times .02}{365} = \$40,048.34$ at 2%.

$\frac{\$63,945,460 \times .03}{365} = \$5,255.79$ at 3%.

$\frac{\$118,489,900 \times .04}{365} = \$12,985.19$ at 4%.

$\$58,289.32$, total for one day.

$31 \times \$58,289.32 = \$1,806,968.92$, for August.

28. 2% of \$730,882,130 = \$14,617,642.60, annual interest at 2%.

3% of \$63,945,460 = \$1,918,363.80, annual interest at 3%.

4% of \$118,489,900 = \$4,739,596.00, annual interest at 4%.

U. S. debt = \$913,317,490; \$21,275,602.40, annual interest on U. S. debt.

$\$21,275,602.40 \div \$913,317,490 = .02329 = 2.329\%$, average rate.

Page 283

1. $150 \times \$2.50 = \375 , semiannual dividend.
 2% of $\$375 = \7.50 , int. for $\frac{1}{2}$ yr. on semiannual dividend.
 $(2 \times \$375) + \$7.50 = \$757.50$, income from stock.
 2% of $\$18,000 = \360 , semiannual interest.
 2% of $\$360 = \7.20 , int. for $\frac{1}{2}$ yr. on semiannual interest.
 $(2 \times \$360) + \$7.20 = \$727.20$, annual interest.
 $\$757.50 - \$727.20 = \$30.30$, stock is better.
2. 2% of $\$16,475,000 = \$329,500$, semiannual int. on deposits.
 2% of $\$329,500 = \6590 , int. on semiannual int. due depositors.
 $2 \times \$329,500 + \$6590 = \$665,590$, total int. on deposits.
 $2\frac{1}{4}\%$ of $\$14,850,000 = \$408,375$, semiannual int. on bond and mortgage.
 (This amount, $\$408,375$, becomes a part of the undivided profits, and hence does not draw interest for the second half of the year.)
 $2 \times \$408,375 = \$816,750$, total int. on bond and mortgage.
 $\$816,750 - \$665,590 = \$151,160$, gain in interest.
3. 3% of $\$45,000 = \1350 , interest on deposit.

$\$450$	$00 = \text{int. for 2 mo. at } 6\%$	$\$450$	$00 = \text{int. for 2 mo. at } 6\%$
225	$00 = \text{int. for 1 mo. at } 6\%$	12	$900 = \text{int. for 4 mo. at } 6\%$
$\$675$	$00 = \text{int. for 3 mo. at } 6\%$	75	00
		$\$825$	$00 = \text{int. for 4 mo. at } 5\frac{1}{2}\%$

$\$45$	$000 = \text{int. for 6 da. at } 6\%$
6	$360 = \text{int. for 48 da. at } 6\%$
60	
$\$420$	$= \text{int. for 48 da. at } 7\%$

 $\$675 + \$825 + \$420 = \1920 , total interest return.
 $\$1920 - \$1350 = \$570$, gain.
4. 5% of $\$13,875 = \693.75 , discount.
 $\$13,875 - \$693.75 = \$13,181.25$, net amount of bill.

$\$131$	$81.25 = \text{int. for 2 mo.}$
65	$90.62 = \text{int. for 1 mo.}$
$\$197$	$71.87 = \text{int. for 3 mo.}$

 $\$693.75 - \$197.72 = \$496.03$, saved.
5. $5\frac{1}{2}\%$ of $\$2400 = \132 , interest on mortgage.
 $\frac{1}{4}\%$ of $\$3000 = \3.75 , insurance.
 1.8% of $\$3500 = \63 , taxes.

- $\$132 + \$3.75 + \$63 + \$14 + \$50 = \262.75 , total carrying cost.
 $12 \times \$37.50 = \450 , total income.
 $\$450 - \$262.75 = \$187.25$, net income.
 $\$187.25 \div \$1600 = 11.7\%$.
7. $12 \times \$65 = \780 , annual rental.
 $\$780 - \$360 = \$420$, net annual rental.
 $\$420 \div .06 = \7000 , cost of house.
8. $3000 \times \$1.08 = \3240 , amount borrowed.
 From July 8 to August 17 = 40 da.
 $\$32 \overline{) 40} = \text{int. for 60 da.}$
 $\quad 10 \overline{) 80} = \text{int. for 20 da.}$
 $\$21 \overline{) 60} = \text{int. for 40 da.}$
 $\$3240 + \$21.60 = \$3261.60$, total cost.
 $3000 \times \$1.21 = \3630 , selling price of wheat.
 $\$3630 - \$3261.60 = \$368.40$, gain.
9. $(100\% - 20\%) \text{ of selling price} \div 5 = 16\% \text{ of selling price.}$
 $16\% \text{ of } \$8000 = \1280 , face of each note.
 $6\% \text{ of } \$1280 = \76.80 , interest on note due in one year.
 $(1 + 2 + 3 + 4 + 5) \times \$76.80 = \$1152$, total interest.
 $\$8000 + \$1152 = \$9152$, total cost.

Page 284

11. $\$00 \overline{) 35} = \text{int. for 2 mo.}$
 $\quad 00 \overline{) 70} = \text{int. for 4 mo.}$
 $\$37.50 - (\$35 + \$1.70) = \1.80 , extra profit.
12. $1\frac{1}{2}\% \text{ of } \$5000 = \$87.50$, tax.
 $\$87.50 + \$212.50 = \$300.00$, annual carrying cost.
 $8\% \text{ of } \$7500 = \600 , guaranteed net income.
 $\$600 + \$300 = \$900$, necessary gross income.
 $\$900 \div 12 = \75 , monthly rental.
13. $4 \text{ mo.} = \frac{1}{3} \text{ of a year.}$
 $5\% \text{ discount for 4 mo.} = 15\% \text{ discount for 1 year.}$
 Hence 15% on gross amount.
 $15\% + .95 = 15\frac{1}{4}\%$, int. on net amount.
17. $5\% \text{ for 4 mo.} = 15\% \text{ for 1 year on gross amount.}$
 $15\% + .95 = 15\frac{1}{4}\%$ on net amount.
 $5\% \text{ of } \$4378.60 = \218.93 , discount.

\$4378.60 - \$218.93 = \$4159.67, necessary to borrow.

\$41 | 59.67 = int. for 2 mo.

83 | 19.34 = int. for 4 mo.

\$218.93 - \$83.19 = \$135.74, gain.

Page 288

7. $96.30 \times \$30.969202 = \2982.33 , amount of premiums.

$\$2982.33 - \$2000 = \$982.33$, gain.

8. $96.30 \times \$12.486351 = \1202.44 , amount of premiums.

$\$2000 - \$1202.44 = \$797.56$, loss.

10. In 25 yr. \$1 at 4% amounts to \$2.66583633.

$\$5000 \div 2.66583633 = \1875.58 , deposit.

Page 290

1. $\$75,000 \div 20.023588 = \3745.58 , sinking fund.

Page 291

2. $\$10,000,000 \div 31.371423 = \$318,761.44$, sinking fund.

3. $100 \times \$2.19112314 = \219.11 , amount of \$100 in 20 yr. at 4%.

$\$219.11 \div 29.778079 = \7.36 , annual payment.

4. $\$3,000,000 \div 31.371423 = \$95,628.43$, sinking fund.

Page 304

DATE OF MATURITY	TERM OF DISCOUNT	INTEREST	AMOUNT	DISCOUNT	COLLECTION	PROCEEDS
1. Oct. 1	52 days	\$14.00	\$1414.00	\$12.25	\$1.77	\$1399.98
2. Aug. 15	75 days	19.38	1569.38	16.35		1553.03
3. May 16	60 days	43.20	2203.20	25.70	2.75	2174.75
4. Feb. 8	50 days	5.60	565.60	6.28	1.41	557.91
5. Dec. 1	82 days	23.50	963.50	10.97	2.41	950.12
6. Feb. 20	81 days	18.67	1138.67	15.37		1123.30
7. Sept. 10	75 days	43.13	2918.13	24.32	2.92	2890.80
8. July 4/5	61 days	48.83	3173.83	24.20	3.97	3145.66
9. June 19	36 days	41.78	4741.78	28.45		4713.33
10. Mar. 28	27 days	25.50	5125.50	23.06	2.56	5099.88
11. Oct. 8	68 days	95.70	6475.70	73.39	8.09	6394.22
12. Aug. 3	56 days	47.28	4775.68	37.14	5.97	4732.57

Page 306

15. $\$80 \div 1.015 = \78.82 , present worth of credit price.
 $\$78.82 - \$75 = \$3.82$, better.
16. $\$420 - \$400 = \$20$, interest on $\$400$ for 4 mo.
 $\$20 \div \$400 = .05 = 5\%$, rate for 4 mo.
4 mo. = $\frac{1}{3}$ yr. Hence $3 \times 5\% = 15\%$, rate per annum.
18. $\$4080 \div 1.02 = \4000 , present worth.
 $\$4080 - \$4000 = \$80$, true discount.
 $.02 \times \$4080 = \81.60 , interest.
 $\$81.60 - \$80 = \$1.60$, difference.
 $.02 \times \$80 = \1.60 , interest on true discount.
Hence, the difference between the true discount and the interest is equal to the interest on the true discount.
20. April 10 + 5 mo. = Sept. 10, due date. From June 20 to Sept. 10 = 82 da., time $\$3000$ was paid before due.
The interest on $\$3000$ for 82 da. = $\$41$.
 $\$3000 + \41 (int.) = $\$3041$, amount canceled by payment of $\$3000$ before due.
 $\$5600 - \$3041 = \$2559$, balance due.
From August 1 to September 10 = 40 da., time final payment was made before due.
Int. on $\$1$ at 6% for 40 da. = $\$.006\frac{2}{3}$.
 $\$1.00 + \$.006\frac{2}{3} = \$1.006\frac{2}{3}$, amount of $\$1.00$.
 $\$2559 \div 1.006\frac{2}{3} = \2542.05 , final payment.

Page 308

1. Principal sum due,	\$2500.00
Int. from May 1, 1908 to Dec. 1, 1908 (7 mo.),	87.50
Amount due Dec. 1, 1908,	<u>2587.50</u>
Payment Dec. 1, 1908,	500.00
Balance due to draw int. from Dec. 1, 1908,	<u>2087.50</u>
Int. from Dec. 1, 1908 to June 21, 1909 (6 mo. 20 da.),	69.58
Amount due June 21, 1909,	<u>2157.08</u>
Payment June 21, 1909,	300.00
Balance due to draw int. from June 21, 1909,	<u>1857.08</u>
Int. from June 21, 1909 to Jan. 15, 1910 (6 mo. 24 da.),	63.14
Amount due Jan. 15, 1910,	<u>1920.22</u>
Payment Jan. 15, 1910,	1000.00
Balance due to draw int. from Jan. 15, 1910,	<u>920.22</u>
Int. from Jan. 15, 1910 to May 1, 1911 (1 yr. 3 mo. 16 da.),	71.47
Amount due May 1, 1911,	<u>\$991.69</u>
2. Principal sum due,	\$5000.00
Int. from Aug. 7, 1907 to Sept. 1, 1908 (1 yr. 24 da.),	266.67
Amount due Sept. 1, 1908,	<u>5266.67</u>
Payment Sept 1, 1908,	1200.00
Balance due to draw interest from Sept. 1, 1908,	<u>4066.67</u>
Int. from Sept. 1, 1908 to Aug. 15, 1909 (11 mo. 14 da.),	194.30
Amount due Aug. 15, 1909,	<u>4260.97</u>
Payment Aug. 15, 1909,	1500.00
Balance due to draw int. from Aug. 15, 1909,	<u>2760.97</u>
Int. from Aug. 15, 1909 to Dec. 20, 1910 (1 yr. 4 mo. 5 da.),	185.98
Amount due Dec. 20, 1910,	<u>2946.95</u>
Payment Dec. 20, 1910,	1000.00
Balance due to draw int. from Dec. 20, 1910,	<u>1946.95</u>
Int. from Dec. 20, 1910 to Aug. 7, 1911 (7 mo. 17 da.),	61.38
Amount due Aug. 7, 1911,	<u>\$2008.33</u>

3. Principal sum due,	\$4000.00
Int. from Jan. 10, 1908 to Apr. 20, 1908 (3 mo. 10 da.),	77.78
Amount due Apr. 20, 1908,	4077.78
Payment Apr. 20, 1908,	500.00
Balance due to draw int. from Apr. 20, 1908,	3577.78
Int. from Apr. 20, 1908 to July 30, 1908 (3 mo. 10 da.),	69.57
Payment is less than accrued interest, hence the balance remains unchanged.	
Int. on \$3577.78 from July 30, 1908 to Dec. 10, 1909	
(1 yr. 4 mo. 10 da.),	340.88
Amount due Dec. 10, 1909,	3988.23
Payments July 30, 1908 and Dec. 10, 1909 (\$50 + \$1000),	1050.00
Balance due to draw int. from Dec. 10, 1909,	2938.23
Int. from Dec. 10, 1909 to July 10, 1910 (7 mo.),	119.98
Amount due July 10, 1910,	\$3058.21

Page 310

1.

(By Compound Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
July 1	\$1000	11 mo.	\$55.00	Sept. 20	\$200	8 mo. 11 da.	\$ 8.37
				Dec. 18	300	5 mo. 13 da.	8.15
				1911			
				Apr. 1	300	2 mo.	3.00
	<u>\$1000</u>		<u>\$55.00</u>		<u>\$800</u>		<u>\$19.52</u>

\$1000 + \$55 = \$1055, total debt.

\$800 + \$19.52 = \$819.52, total credit.

\$1055 - \$819.52 = \$235.48, amount due June 1, 1911.

(By Exact Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
July 1	\$1000	335 da.	\$55.83	Sept. 20	\$200	254 da.	\$ 8.47
				Dec. 18	300	165 da.	8.25
				1911			
				Apr. 1	300	61 da.	3.05
	<u>\$1000</u>		<u>\$55.83</u>		<u>\$800</u>		<u>\$19.77</u>

\$1000 + \$55.83 = \$1055.83, total debt.

\$800 + \$19.77 = \$819.77, total credit

\$1055.83 - \$819.77 = \$236.06, amount due June 1, 1911.

2.

(By Compound Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
Oct. 8	\$ 1500	9 mo.	\$ 56.25	Dec. 15 1911	\$ 200	6 mo. 23 da.	\$ 5.64
				Jan. 20	400	5 mo. 18 da.	9.33
				June 14	500	24 da.	1.67
	<u>\$ 1500</u>		<u>\$ 56.25</u>		<u>\$ 1100</u>		<u>\$ 16.64</u>

 $\$1500 + \$56.25 = \$1556.25$, total debt. $\$1100 + \$16.64 = \$1116.64$, total credit. $\$1556.25 - \$1116.64 = \$439.61$, amount due July 8, 1911.

(By Exact Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
Oct. 8	\$ 1500	273 da.	\$ 56.88	Dec. 15 1911	\$ 200	205 da.	\$ 5.69
				Jan. 20	400	169 da.	9.39
				June 14	500	24 da.	1.67
	<u>\$ 1500</u>		<u>\$ 56.88</u>		<u>\$ 1100</u>		<u>\$ 16.75</u>

 $\$1500 + \$56.88 = \$1556.88$, total debt. $\$1100 + \$16.75 = \$1116.75$, total credit. $\$1556.88 - \$1116.75 = \$440.13$, amount due July 8, 1911.

3.

(By Compound Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
Mar 1	\$ 1360	10 mo.	\$ 68.00	May 12	\$ 75	7 mo. 19 da.	\$ 2.86
				June 15	90	6 mo. 16 da.	2.94
				Aug. 20	120	4 mo. 11 da.	2.62
				Oct. 11	250	2 mo 20 da.	3.33
				Nov. 4	300	1 mo. 27 da.	2.85
	<u>\$ 1360</u>		<u>\$ 68.00</u>		<u>\$ 835</u>		<u>\$ 14.60</u>

 $\$1360 + \$68 = \$1428$, total debt. $\$835 + \$14.60 = \$849.60$, total credit. $\$1428 - \$849.60 = \$578.40$, amount due Jan. 1, 1911.

(By Exact Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
Mar. 1	\$ 1360	306 da.	\$ 69.36	May 1	\$ 75	234 da.	\$ 2.93
				June 15	90	200 da.	3.00
				Aug. 20	120	134 da.	2.68
				Oct. 11	250	82 da.	3.42
				Nov. 4	300	58 da.	2.90
	<u>\$ 1360</u>		<u>\$ 69.36</u>		<u>\$ 835</u>		<u>\$ 14.93</u>

$\$ 1360 + \$ 69.36 = \$ 1429.36$, total debt.

$\$ 835 + \$ 14.93 = \$ 849.93$, total credit.

$\$ 1429.36 - \$ 849.93 = \$ 579.43$, amount due Jan. 1, 1911.

4.

(By Compound Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
April 30	\$ 930	8 mo.	\$ 43.40	June 10	\$ 80	6 mo. 20 da.	\$ 3.11
				July 13	\$ 125	5 mo. 17 da.	4.06
				Sept. 15	\$ 250	3 mo. 15 da.	5.10
				Nov. 20	200	1 mo. 10 da.	1.56
	<u>\$ 930</u>		<u>\$ 43.40</u>		<u>\$ 655</u>		<u>\$ 13.83</u>

$\$ 930 + \$ 43.40 = \$ 973.40$, total debt.

$\$ 655 + \$ 13.83 = \$ 668.83$, total credit.

$\$ 973.40 - \$ 668.83 = \$ 304.57$, amount due Dec. 30, 1910.

(By Exact Time)

DATE 1910	AMOUNT	TIME	INTEREST	DATE 1910	AMOUNT	TIME	INTEREST
April 30	\$ 930	244 da.	\$ 44.12	June 10	\$ 80	203 da.	\$ 3.16
				July 13	125	170 da.	\$ 4.13
				Sept. 15	250	106 da.	5.15
				Nov. 20	200	40 da.	1.56
	<u>\$ 930</u>		<u>\$ 44.12</u>		<u>\$ 655</u>		<u>\$ 14.00</u>

$\$ 930 + \$ 44.12 = \$ 974.12$, total debt.

$\$ 655 + \$ 14 = \$ 669$, total credit.

$\$ 974.12 - \$ 669 = \$ 305.12$, amount due Dec. 30, 1910.

Page 312

1.

First year

20% cash		\$ 800
Int. on 1st mortgage	\$ 110	
Int. on 2d mortgage	68.40	
Taxes, water rents, etc.	75	
On % prin. 2d mortgage	<u>240</u>	493.40

Second year

Int. on 1st mortgage	\$ 110	
Int. on 2d mortgage	54	
Taxes, water rents, etc.	75	
On % prin. 2d mortgage	<u>240</u>	479.00

Third year

Int. on 1st mortgage	\$ 110	
Int. on 2d mortgage	39.60	
Taxes, water rents, etc.	75	
On % prin. 2d mortgage	<u>240</u>	464.60

Fourth year

Int. on 1st mortgage	\$ 110	
Int. on 2d mortgage	25.20	
Taxes, water rents, etc.	75	
On % prin. 2d mortgage	<u>240</u>	450.20

Fifth year

Int. on 1st mortgage	\$ 110	
Int. on 2d mortgage	10.80	
Taxes, water rents, etc.	75	
On % prin. 2d mortgage	<u>240</u>	435.80
Total outlay 1st 5 years		<u>\$ 3123.00</u>

Sixth year

Face of 1st mortgage		\$ 2000
Former rental	\$ 420	
Carrying cost		
Interest	\$ 110	
Taxes, etc.	<u>75</u>	
Bal. to apply on mortgage		<u>235</u>
Balance due on mortgage		<u>\$ 1765</u>

Carried forward			\$ 1765
<i>Seventh year</i>			
Former rental		\$ 420	
Carrying cost			
Interest	\$ 97.08		
Taxes, etc.	<u>75</u>	<u>172.08</u>	
Bal. to apply on mortgage			<u>247.92</u>
Balance due on mortgage			1517.08
<i>Eighth year</i>			
Former rental		\$ 420	
Carrying cost			
Interest	\$ 83.44		
Taxes, etc.	<u>75</u>	<u>158.44</u>	
Bal. to apply on mortgage			<u>261.56</u>
Balance due on mortgage			1255.52
<i>Ninth year</i>			
Former rental		\$ 420	
Carrying cost			
Interest	\$ 69.05		
Taxes, etc.	<u>75</u>	<u>144.05</u>	
Bal. to apply on mortgage			<u>275.95</u>
Balance due on mortgage			979.57
<i>Tenth year</i>			
Former rental		\$ 420	
Carrying cost			
Interest	\$ 53.88		
Taxes, etc.	<u>75</u>	<u>128.88</u>	
Bal. to apply on mortgage			<u>291.12</u>
Balance due on mortgage			688.45
<i>Eleventh year</i>			
Former rental		\$ 420	
Carrying cost			
Interest	\$ 37.86		
Taxes, etc.	<u>75</u>	<u>112.86</u>	
Bal. to apply on mortgage			<u>307.14</u>
Balance due on mortgage			\$ 381.81

Carried forward

\$881.81

Twelfth year

Former rental		\$ 420	
Carrying cost			
Interest	\$ 20.97		
Taxes, etc.	<u>75</u>	<u>95.97</u>	
Bal. to apply on mortgage			<u>324.03</u>
Balance due on mortgage			57.28

$5\frac{1}{2}\%$ of \$57.28 = \$3.15, interest on balance.

\$57.28 + \$3.15 = \$60.43 amount due at the end of the 13th year.

$7 \times \$420 = \2940 , outlay for 6th to 12th years inclusive.

\$2940 + \$3123 + \$60.43 = \$6123.43, total outlay.

2.

First year

20 % cash		\$ 2600	
Int. on 1st mortgage	\$ 357.50		
Int. on 2d mortgage	222.30		
Taxes, water rents, etc.	225		
On % prin. 2d mortgage	<u>780</u>	<u>1584.80</u>	

Second year

Int. on 1st mortgage	\$ 357.50		
Int. on 2d mortgage	175.50		
Taxes, water rents, etc.	225		
On % prin. 2d mortgage	<u>780</u>	<u>1538.00</u>	

Third year

Int. on 1st mortgage	\$ 357.50		
Int. on 2d mortgage	128.70		
Taxes, water rents, etc.	225		
On % prin. 2d mortgage	<u>780</u>	<u>1491.20</u>	

Fourth year

Int. on 1st mortgage	\$ 357.50		
Int. on 2d mortgage	81.90		
Taxes, water rents, etc.	225		
On % prin. 2d mortgage	<u>780</u>	<u>1444.40</u>	
[Outlay 1st 4 years]			\$ 8658.40*

* Outlay found here simply for convenience in carrying forward the amount.

Carried forward			\$8658.40
<i>Fifth year</i>			
Int. on 1st mortgage		\$357.50	
Int. on 2d mortgage		35.10	
Taxes, water rents, etc.		225	
On $\frac{1}{2}$ prin. 2d mortgage		780	1397.60
Total outlay 1st 5 years			<u>\$10056.00</u>
<i>Sixth year</i>			
Face of 1st mortgage			\$6500
Former rental		\$1320	
Carrying cost			
Interest	\$357.50		
Taxes, etc.	225	582.50	
Bal. to apply on mortgage			737.50
Balance due on mortgage			<u>5762.50</u>
<i>Seventh year</i>			
Former rental		\$1320	
Carrying cost			
Interest	\$316.94		
Taxes, etc.	225	541.94	
Bal. to apply on mortgage			778.06
Balance due on mortgage			<u>4984.44</u>
<i>Eighth year</i>			
Former rental		\$1320	
Carrying cost			
Interest	\$274.14		
Taxes, etc.	225	499.14	
Bal. to apply on mortgage			820.86
Balance due on mortgage			<u>4163.58</u>
<i>Ninth year</i>			
Former rental		\$1320	
Carrying cost			
Interest	\$229		
Taxes, etc.	225	454	
Bal. to apply on mortgage			866.00
Balance due on mortgage			<u>\$3297.58</u>

Carried forward			\$ 3297.58
<i>Tenth year</i>			
Former rental		\$ 1320	
Carrying cost			
Interest	\$ 181.37		
Taxes, etc.	<u>225</u>	<u>406.37</u>	
Bal. to apply on mortgage			<u>913.63</u>
Balance due on mortgage			2383.95
<i>Eleventh year</i>			
Former rental		\$ 1320	
Carrying cost			
Interest	\$ 181.12		
Taxes, etc.	<u>225</u>	<u>356.12</u>	
Bal. to apply on mortgage			<u>963.88</u>
Balance due on mortgage			1420.07
<i>Twelfth year</i>			
Former rental		\$ 1320	
Carrying cost			
Interest	\$ 78.10		
Taxes, etc.	<u>225</u>	<u>303.10</u>	
Bal. to apply on mortgage			<u>1016.90</u>
Balance due on mortgage			403.17

$5\frac{1}{2}\%$ of \$ 403.17 = 22.17, interest on balance.

\$ 403.17 + \$ 22.17 = \$ 425.34, amount due at the end of the 13th year.

$7 \times \$ 1320 = \$ 9240$, outlay for 6th to 12th years inclusive.

\$ 9240 + \$ 10,056 + \$ 425.34 = \$ 19,721.34, total outlay.

3.

<i>First year</i>			
20 % cash			\$ 700
Int. on 1st mortgage		\$ 96.25	
Int. on 2d mortgage		59.85	
Taxes, water rents, etc.		70	
On % prin. 2d mortgage		<u>210</u>	<u>436.10</u>
<i>Second year</i>			
Int. on 1st mortgage		\$ 96.25	
Int. on 2d mortgage		47.25	
Taxes, water rents, etc.		70	
On % prin. 2d mortgage		<u>210</u>	<u>423.50</u>
[Outlay 1st 2 years]			\$ 1559.60

Carried forward			\$ 1559.80
	<i>Third year</i>		
Int. on 1st mortgage		\$ 96.25	
Int. on 2d mortgage		34.65	
Taxes, water rent, etc.		70	
On % prin. 2d mortgage		<u>210</u>	410.90
	<i>Fourth year</i>		
Int. on 1st mortgage		\$ 96.25	
Int. on 2d mortgage		22.05	
Taxes, water rents, etc		70	
On % prin. 2d mortgage		<u>210</u>	398.30
	<i>Fifth year</i>		
Int. on 1st mortgage		\$ 96.25	
Int. on 2d mortgage		9.45	
Taxes, water rents, etc.		70	
On % prin. 2d mortgage		<u>210</u>	385.70
Total outlay 1st 5 years			<u>\$ 2754.50</u>
	<i>Sixth year</i>		
Face of 1st mortgage			\$ 1750
Former rental		\$ 400	
Carrying cost			
Interest	\$ 96.25		
Taxes, etc.	<u>70</u>	<u>166.25</u>	
Bal. to apply on mortgage			<u>233.75</u>
Balance due on mortgage			1516.25
	<i>Seventh year</i>		
Former rental.		\$ 400	
Carrying cost			
Interest	\$ 83.39		
Taxes, etc.	<u>70</u>	<u>153.39</u>	
Bal. to apply on mortgage			<u>246.61</u>
Balance due on mortgage			1269.64
	<i>Eighth year</i>		
Former rental		\$ 400	
Carrying cost			
Interest	\$ 69.83		
Taxes, etc.	<u>70</u>	<u>139.83</u>	
Bal. to apply on mortgage			<u>260.17</u>
Balance due on mortgage			\$ 1009.47

Carried forward			\$ 1009.47
	<i>Ninth year</i>		
Former rental		\$ 400	
Carrying cost			
Interest	\$ 55.52		
Taxes, etc.	<u>70</u>	<u>125.52</u>	
Bal. to apply on mortgage			<u>274.48</u>
Balance due on mortgage			734.99
	<i>Tenth year</i>		
Former rental		\$ 400	
Carrying cost			
Interest	\$ 40.42		
Taxes, etc.	<u>70</u>	<u>110.42</u>	
Bal. to apply on mortgage			<u>289.58</u>
Balance due on mortgage			445.41
	<i>Eleventh year</i>		
Former rental		\$ 400	
Carrying cost			
Interest	\$ 24.50		
Taxes, etc.	<u>70</u>	<u>94.50</u>	
Bal. to apply on mortgage			<u>305.50</u>
Balance due on mortgage			139.91

$5\frac{1}{2}\%$ of \$ 139.91 = \$ 7.70, interest on balance.

\$ 139.91 + \$ 7.70 = \$ 147.61, amount due at the end of the 12th year.

$6 \times \$ 400 = \$ 2400$, outlay for 6th to 11th years inclusive.

\$ 2400 + \$ 2754.50 + \$ 147.61 = \$ 5302.11, total outlay.

4.

	<i>First year</i>		
20 % cash			\$ 3200.00
Int. on 1st mortgage		\$ 440	
Int. on 2d mortgage		273.60	
Taxes, water rents, etc.		300	
On % prin. 2d mortgage		<u>960</u>	1973.60
	<i>Second year</i>		
Int. on 1st mortgage		\$ 440	
Int. on 2d mortgage		216	
Taxes, water rents, etc.		300	
On % prin. 2d mortgage		<u>960</u>	1916
[Outlay 1st 2 years]			\$ 7089.60